PLANT'S MACHINERY LIMITED

CATALOGUE 1918

E. LEONARD & SONS LIMITED

ENGINES & BOILERS

LONDON, ONT.

MONTREAL, QUE. ST. JOHN N.B.

CALGARY, ALTA. WINNIPEG, MAN.

VANCOUVER, BC.

1790 ST. JAMES STREET,
MONTREAL, P.Q.

INTRODUCTION

THE NAME OF LEONARD has been associated with the iron industry for many years.

In 1830, Elijah Leonard left Syracuse, N. Y., to engage in business for himself in Canada. Eventually reaching London, Ontario, he established a factory for the manufacture of farm implements, but, owing to the rapid development of the country, a demand was created for small engines and boilers, which he undertook to supply.

Successful in this new departure, he erected larger and better equipped shops, and, in 1875, admitted two sons into partnership, who, since his death in May, 1891, have continued the business under the old name of E. Leonard & Sons, and in 1913 incorporated under the same name, E. Leonard & Sons, Limited.

As a result of all these years of steady development and fruitful experience, we feel confident that our styles of Engines and Boilers stand unexcelled in the market.

Our large plant (devoted solely to this class of work) is thoroughly equipped with modern tools, handled by skillful workmen, while the favorable position of London on the Grand Trunk, Canadian Pacific, Michigan Central and Pere Marquette Railways gives shipping facilities that provide for prompt deliveries.

We ask your careful consideration of the following pages, which are descriptive of our highest grade of Engines and Boilers.

Should you require any of the various goods illustrated, we shall be glad to mail detailed information and prices or have our representative call upon you.

Trusting to receive your valued enquiries, which will receive prompt attention.

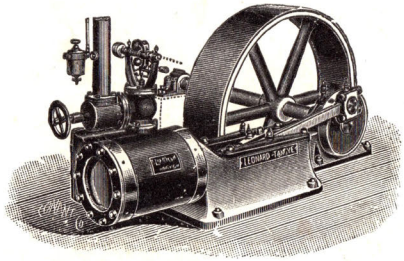
Yours respectfully,

PLANT'S MACHINERY LIMITED

E. Leonard & Sons, Limited

1790 ST. JAMES STREET,
MONTREAL, P.Q.

PLANT'S MACHINERY LIMITED
1155 ST. JAMES STREET,
MONTREAL, P.Q.



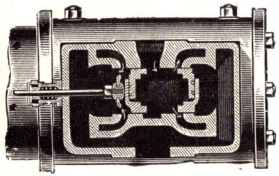
THE LEONARD-TANDEM ENGINE has been offered to the steam-using public for the last fifteen or twenty years, and is manufactured in different sizes, covering from 75 to 250 H.-P.

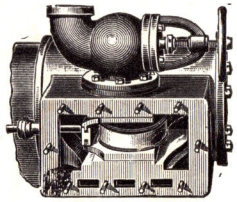
The illustration shown on the opposite page has been somewhat changed, but will suffice for the requirements of selling. The **Evans Noiseless Governor** is still employed, and is explained with more particulars on page 24. It is a most perfect machine.

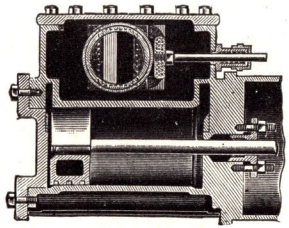
THE BALL BALANCED VALVE, as illustrated on this page, has now been applied with great success to its operation.

THE CONNECTING ROD has the usual interchangeable babbitted liners, which make it very simple to replace, as they are set into their place without having to go to a machine shop to have any fitting done. **The Cross-head End** has the usual Strap, Gib and Key with brass boxes.

THE MAIN BEARING is unusually large; much more so than what the engine shaft is. This makes a very strong, solid part of the engine, and we claim the greatest durability for heavy, continuous work, such as is required by a Saw or Planing mill.



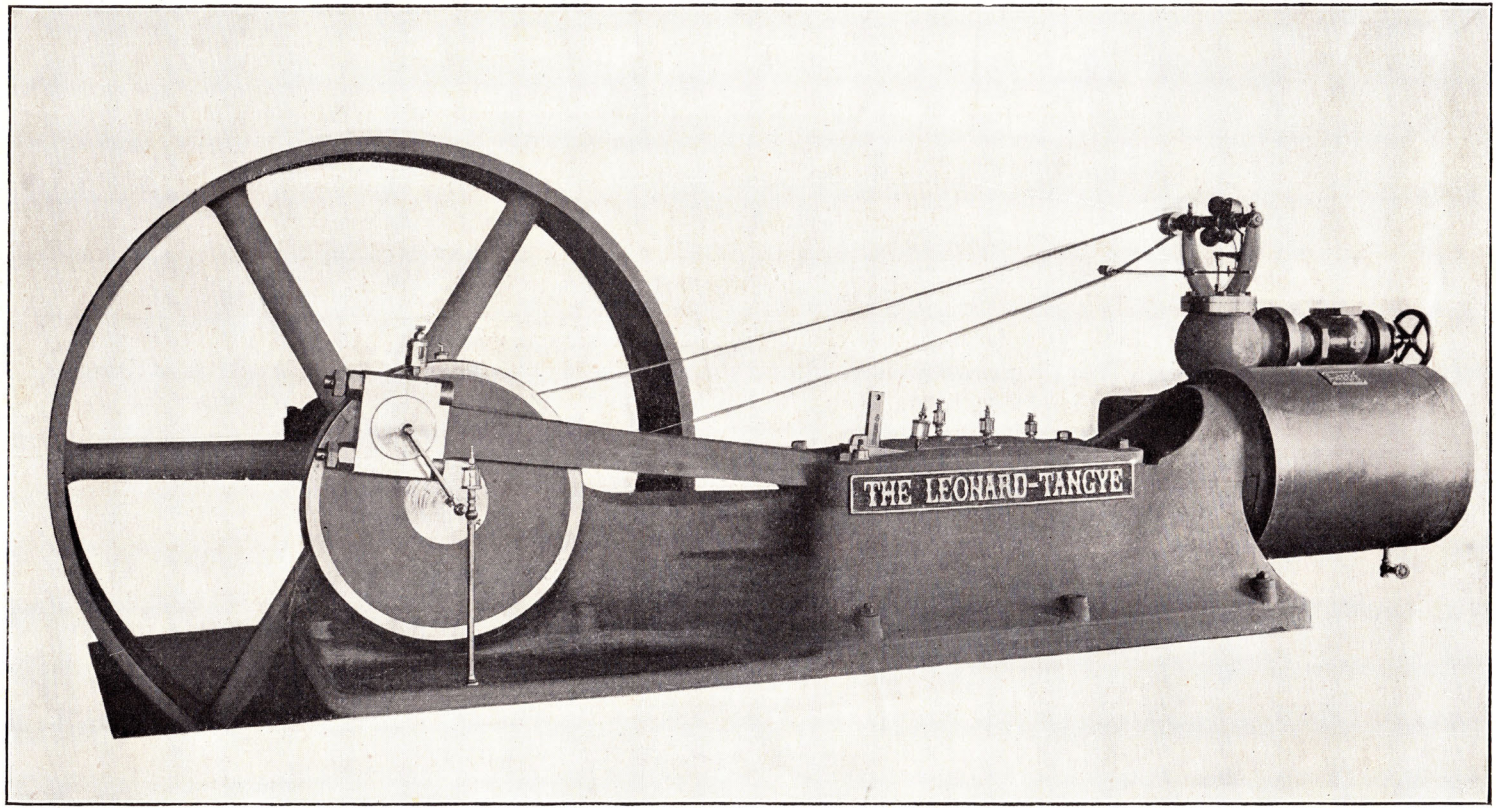




THESE ENGINES, when set up, and started as per instructions sent with Engine, will give the best service of any engine offered to the Canadian public.

We have manufactured and sold up to the present a great many of these engines.

PLANT'S MA

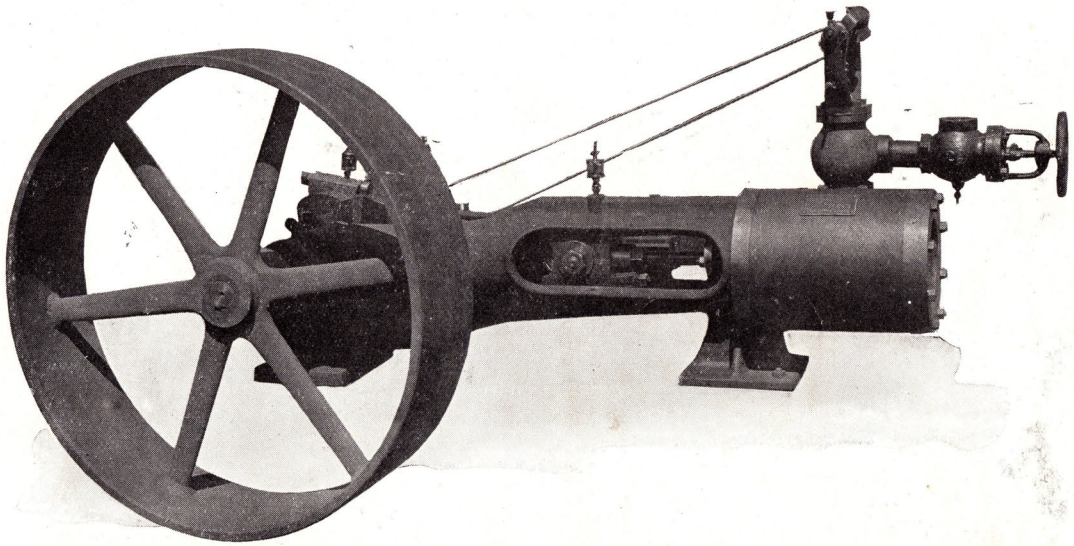


LEONARD-TANGYE ENGINE

With Evans' Patent Governor. Ball's Balanced Slide Valve and Large Bearing Surfaces. 75 Horse-power to 250 Horse-power. Kept in stock, right or left-hand. Above cut shows a right-hand engine.

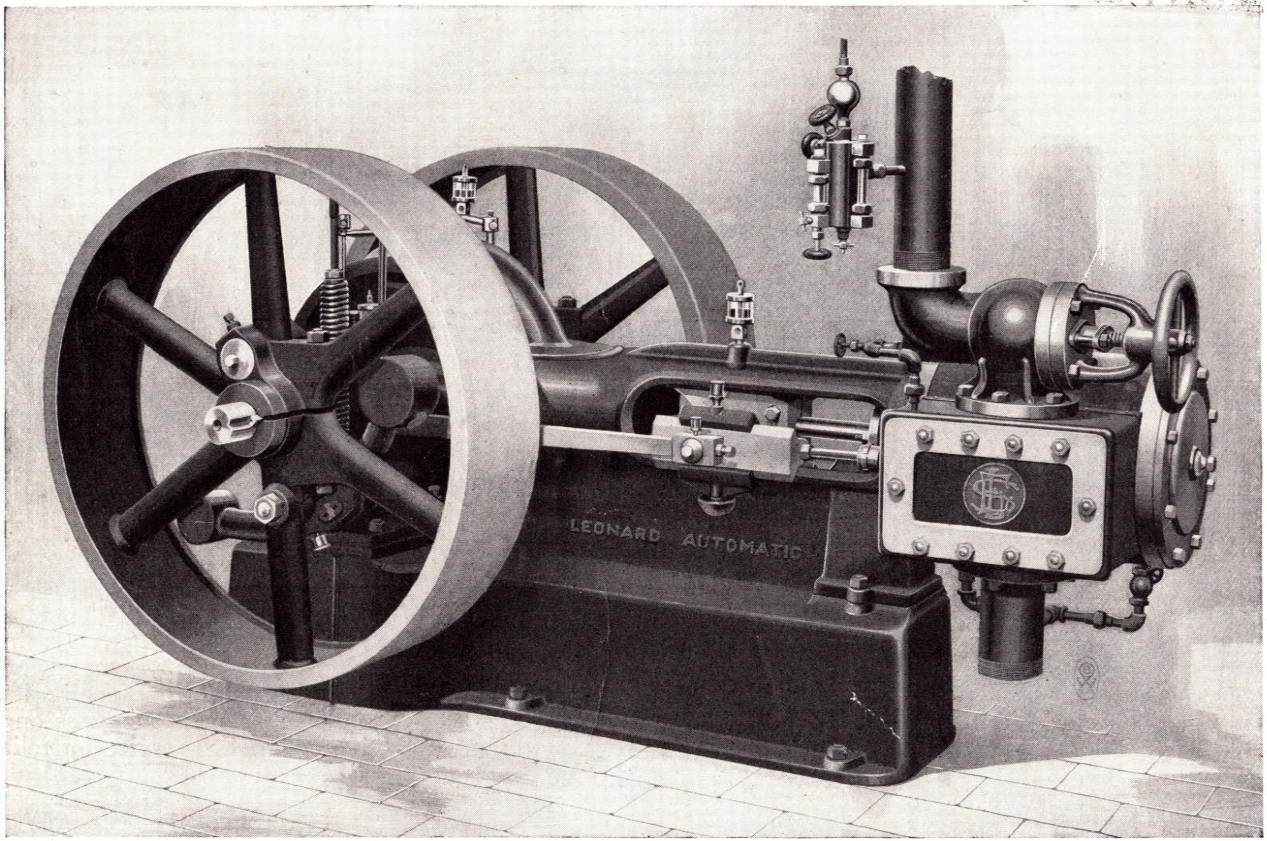
CHINERY LIMITED
London, Canada
MONTREAL, P.Q.

Leonard Clipper Engine



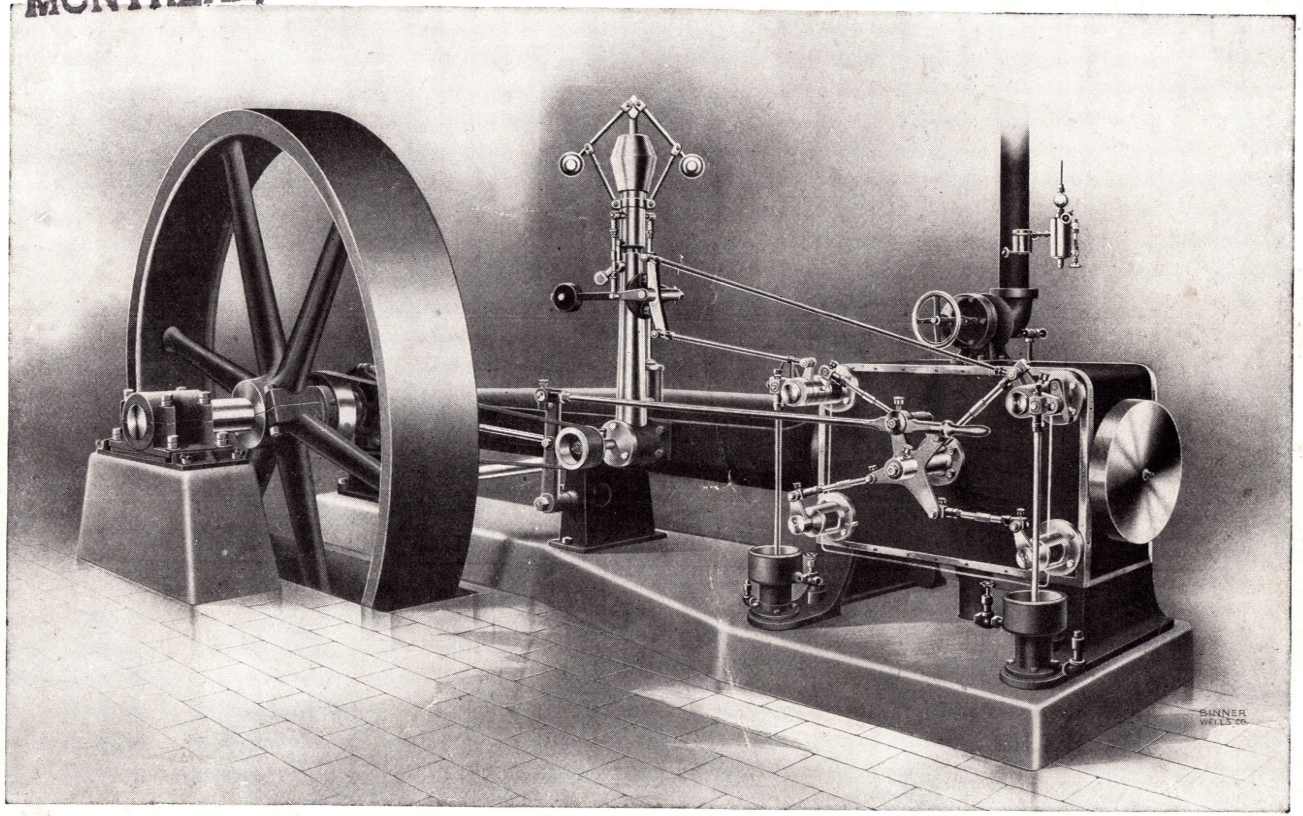
LEONARD CLIPPER ENGINE—ECCENTRIC SIDE

The Leonard Clipper Engine is made of the best materials throughout and is carefully constructed in an up-to-date manner by competent workmen. It is designed to fill the widespread and growing demand for an engine capable of doing heavy, continuous work with the least amount of care and attention. Since its introduction many years ago, it has proved itself to be one of the most popular, moderate priced engines on the market. Hundreds of Leonard Clipper Engines are in use to-day and they give unequalled service for reliable power with a minimum of care and attention. These Engines are equipped with ball balanced, never-leaking valve, as described on page 2.

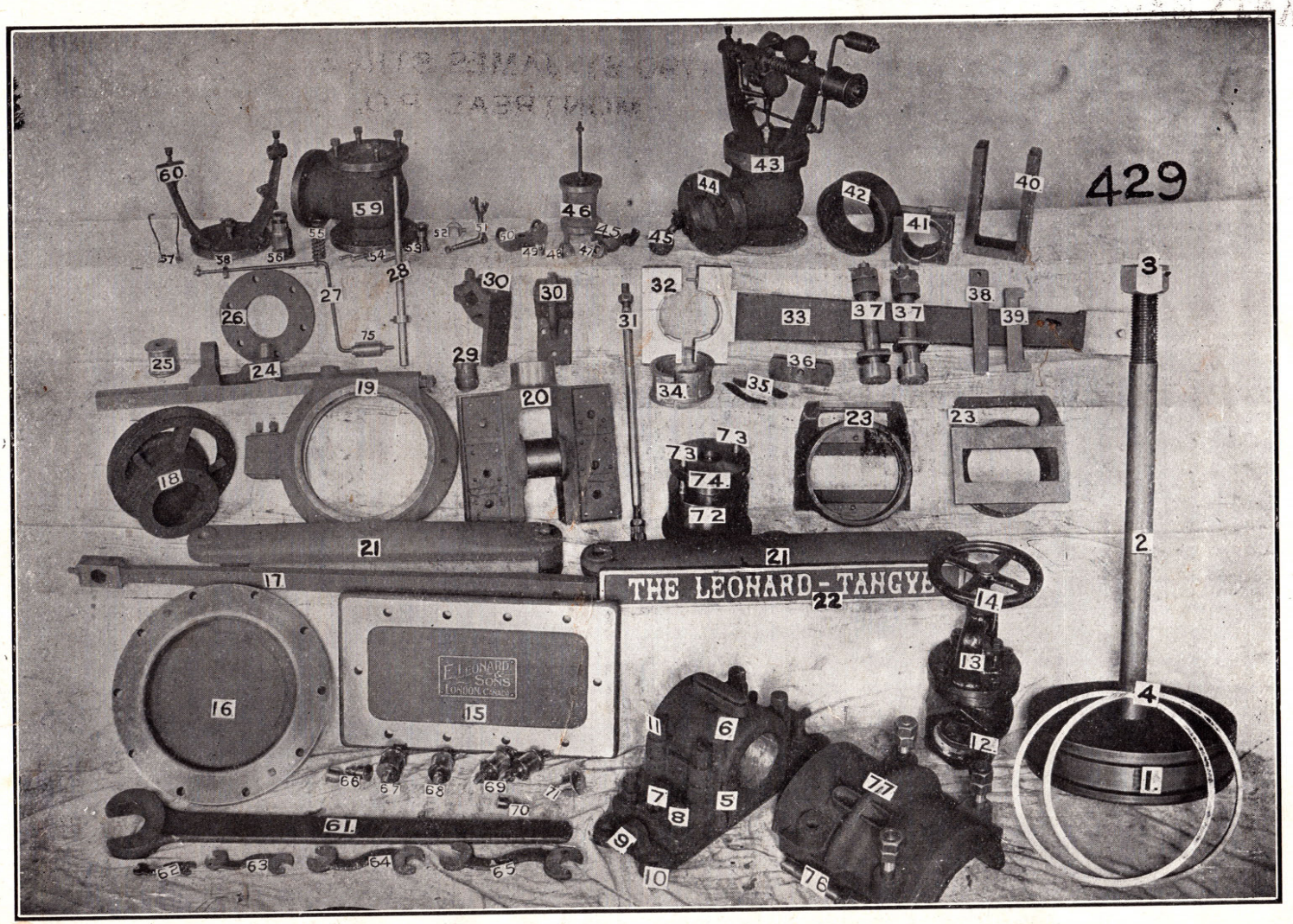


LEONARD AUTOMATIC ENGINE—GOVERNOR PULLY

CHINERY LIMITED
London, Canada
MONTREAL, P.Q.



LEONARD-CORLISS STANDARD ENGINE—GIRDER FRAME—VALVE GEAR SIDE.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THE LEONARD-TANGYE
E. LEONARD & SONS
LONDON, CANADA

PLANT'S MACHINERY LIMITED

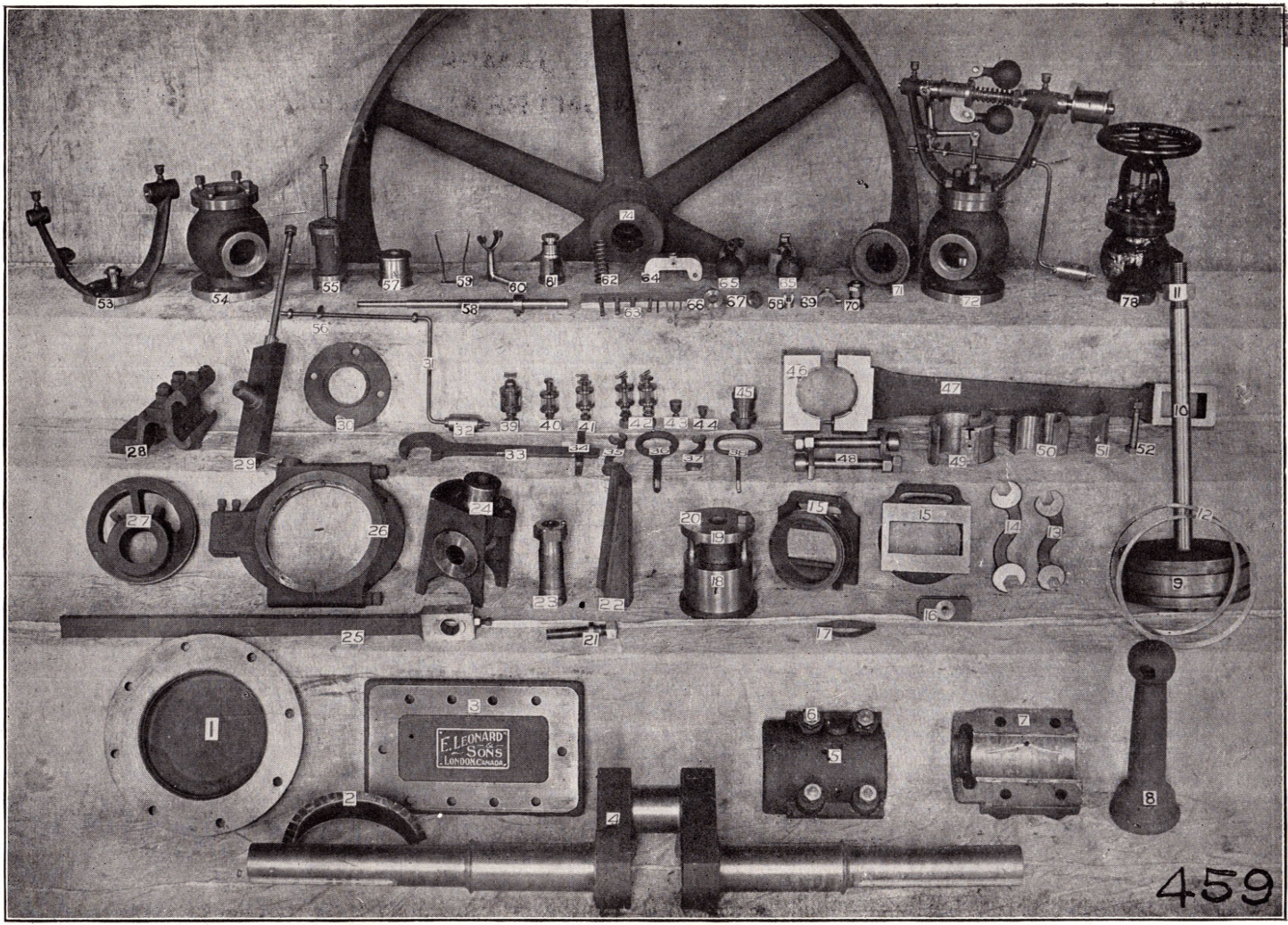
1790 ST. JAMES STREET,
MONTREAL, P.Q.

List of Parts of Leonard Tangye Engine

PIECE NO.	
No. 1	Piston Head.
" 2	Piston Rod.
" 3	Nut on Piston Rod.
" 4	Piston Rings.
" 5	Outer Bearing, lower half.
" 6	Outer Bearing Cap.
" 7	Studs, Outer Bearing to Sole Plate.
" 8	Adjusting Screws in Outer Bearing.
" 9	Adjusting Screws at Side of Outer Bearing.
" 10	Sole Plate for Outer Bearing.
" 11	Studs, Cap to Outer Bearing.
" 12	Angle Valve Body.
" 13	Angle Valve Top or Bonnet.
" 14	Hand Wheel on Angle Valve.
" 15	Steam Chest Cover.
" 16	Cylinder Cover or Head.
" 17	Eccentric Rod.
" 18	Eccentric Eye.
" 19	Eccentric Strap.
" 20	Crosshead.
" 21	Guide Bars for Crosshead.
" 22	Name Plate.
" 23	Ball Slide Valve.
" 24	Slide Bar for Valve Rod.
" 25	Pulley on Governor.
" 26	Exhaust Flange on Steam Chest.

PIECE NO.	
No. 27	Steel Safety Stop with Pulley on Governor.
" 28	Steel Shaft in Governor.
" 29	Bush and Gland for Valve Rod.
" 30	Bracket Bearings on Slide Bar for Valve.
" 31	Valve Rod connecting Valve to Slide Bar.
" 32	Cap of Connecting Rod, Crank Pin End.
" 33	Connecting Rod Body.
" 34	Babbit Liners for Crank Pin.
" 35	Springs in Slide Valve.
" 36	Nut on Ball Slide Valve.
" 37	Bolts in Crank End of Connecting Rod.
" 38	Jib for Connecting Rod, Crosshead end.
" 39	Key for Connecting Rod, Crosshead end.
" 40	Strap for Connecting Rod.
" 41	Box, Crosshead end of Connecting Rod.
" 42	Pulley on Engine Shaft to drive Governor.
" 43	Governor, Evans type.
" 44	Steam Flange on Governor.
" 45	Governor Bolts.
" 46	Valve in Governor.
" 47	Collar on Governor Shaft.
" 48	Brass Nut on Governor Shaft.
" 49	Brass Coupling, Bell Crank to Valve Stem.
" 50	Brass Ball Section.
" 51	Brass Bell Crank.

PIECE NO.	
No. 52	Brass Saddle.
" 53	Brass Gland for Valve Stem.
" 54	Pins in Ball Section, and Bell Crank.
" 55	Governor Spring.
" 56	Yoke, Cast Iron.
" 57	Plate and Wires for Safety Stop.
" 58	Cam on Safety Stop Frame.
" 59	Evans Governor Body.
" 60	Governor Top or Frame.
" 61	Wrench for Piston Rod Nut on Crosshead.
" 62	Wrench for $1\frac{5}{8}$ and $1\frac{7}{16}$ inch.
" 63	Wrench for $1\frac{1}{4}$ and $1\frac{1}{16}$ inch.
" 64	Wrench for 1 and $\frac{3}{4}$ inch.
" 65	Wrench for $\frac{3}{4}$ and $\frac{9}{16}$ inch.
" 66	Oil Cups for Valve Rod Slide Bar.
" 67	Oil Cups for Crank Pin.
" 68	Oil Cup for Eccentric Strap.
" 69	Oil Cups for Guide Bars.
" 70	Oil Cup for Slide Bar Pin.
" 71	Grease Cup for Crank Pin.
" 72	Piston Rod Bushing.
" 73	Gland Studs in Piston Bushing.
" 74	Gland in Piston Bushing.
" 75	Pulley on Safety Stop.
" 76	Studs in Main Bearing Cap.
" 77	Main Bearing Cap.


E. LEONARD & SONS
LONDON, CANADA.
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'S MACHINERY LIMITED

MONTREAL, P.Q.

Numbers and Names of Parts of "Leonard Clipper Engine" Center-Crank Type

PIECE NO.

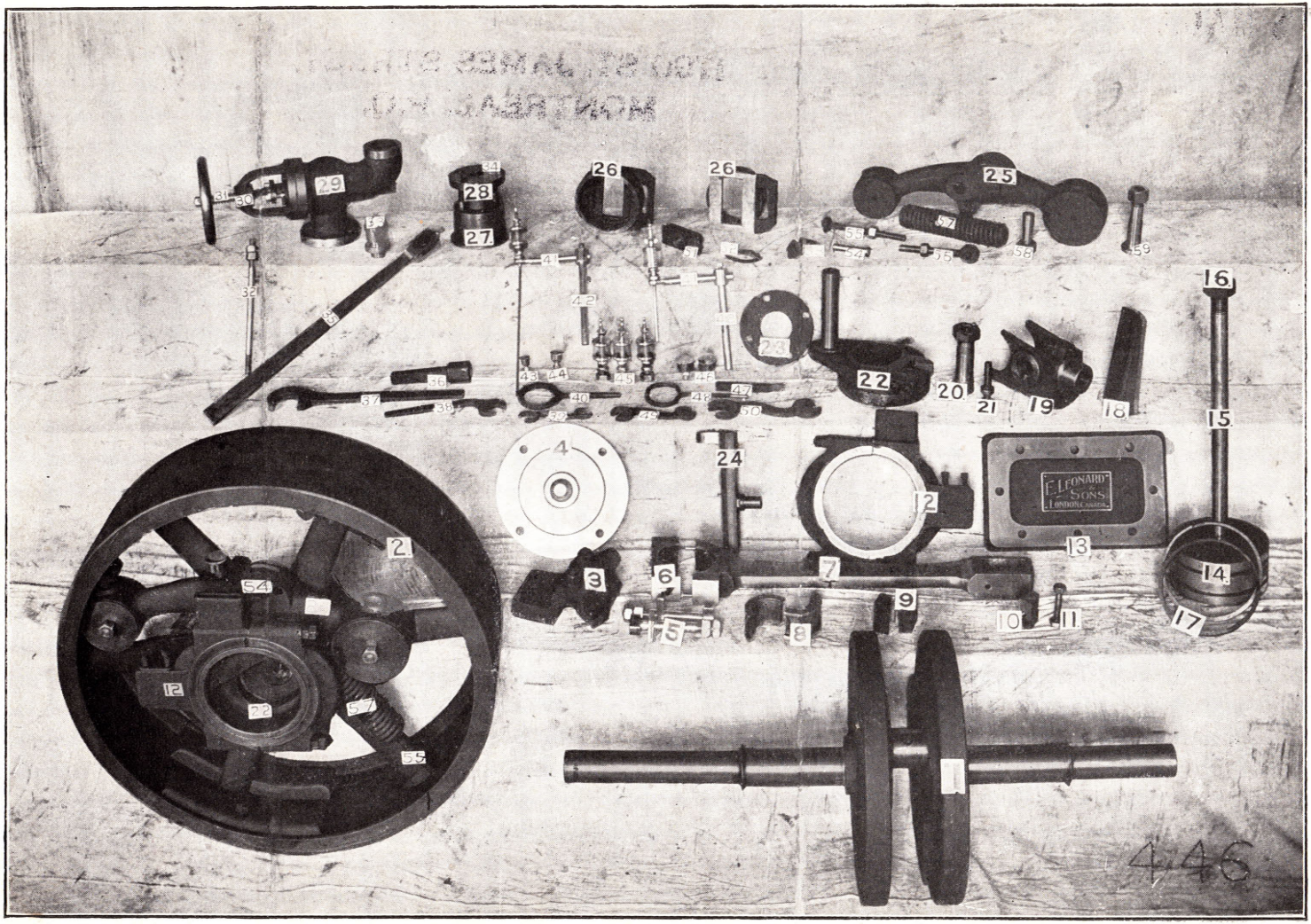
No. 1 Cylinder Head.
" 2 Sheet Iron for Removing Piston Rings.
" 3 Steam Chest Cover.
" 4 Crank Shaft.
" 5 Main Bearing Cap.
" 6 Main Bearing Cap Bolt.
" 7 Main Bearing Cap (showing babbitt.)
" 8 Box Wrench.
" 9 Piston Head.
" 10 Piston Rod.
" 11 Piston Nut. Crosshead End.
" 12 Piston Rings
" 13 Wrench.
" 14 Wrench.
" 15 Ball Slide Valve.
" 16 Ball Slide Valve Nut.
" 17 Ball Slide Valve Springs.
" 18 Piston Bush.
" 19 Piston Gland.
" 20 Piston Gland Studs.
" 21 Adjusting Screw for Crosshead Shoe.
" 22 Shoe for Improved Crosshead.
" 23 Pin and Nut for Improved Crosshead.
" 24 Crosshead, Improved Type.
" 25 Eccentric Rod.
" 26 Eccentric Straps.

PIECE NO.

No. 27 Eccentric Eye.
" 28 Bracket for Valve Rod Slide Bar.
" 29 Valve Rod Slide Bar.
" 30 Exhaust Flange.
" 31 Safety Stop Lever for Evans Governor.
" 32 Safety Stop Pulley for Evans Governor.
" 33 Wrench.
" 34 Wrench.
" 35 Wrench.
" 36 Eye Bolt.
" 37 Wrench.
" 38 Eye Bolt.
" 39 Oil Cup for Crank Pin.
" 40 Oil Cup for Crosshead.
" 41 Oil Cup for
" 42 Oil Cup for Main Bearing.
" 43 Oil Cup for
" 44 Oil Cup for Evans Governor.
" 45 Valve Rod Bush and Gland.
" 46 Cap for Crank End of Con Rod.
" 47 Connecting Rod Body.
" 48 Connecting Rod Bolts.
" 49 Crank Pin Liners.
" 50 Bronze Box for Crosshead End of Connecting Rod.

PIECE NO.

No. 51 Block for Adjusting Crosshead Box.
" 52 Bolt for Adjusting Crosshead Box.
" 53 Top for Evans Governor.
" 54 Evans Governor Body.
" 55 Valve for Evans Governor.
" 56 Cam for Safety Stop for Evans Governor.
" 57 Pulley for Evans Governor.
" 58 Spindle for Evans Governor.
" 59 Safety Stop Attachment for Evans Governor.
" 60 Bell Crank for Evans Governor.
" 61 Yoke for Evans Governor.
" 62 Spring for Evans Governor.
" 63 Pins for Evans Governor.
" 64 Ball Section for Evans Governor.
" 65 Balls for Evans Governor.
" 66 Brass Collar for Evans Governor.
" 67 Hexagon Nut for Evans Governor.
" 68 Coupling for Evans Governor.
" 69 Saddle for Evans Governor.
" 70 Bush and Gland for Evans Governor.
" 71 Governor Pulley on Crank Shaft.
" 72 Evans Governor Assembled.
" 73 Angle Starting Valve.
" 74 Balance Wheel Pulley.


F. LEONARD & SONS
LONDON, ONTARIO
446

PLANT'S MACHINERY LIMITED

299 ST. JAMES STREET,
MONTREAL, P.Q.

Names of the parts with the No. for Single-Cylinder Leonard Automatic Engine, Center-crank Type.

PIECE NO.

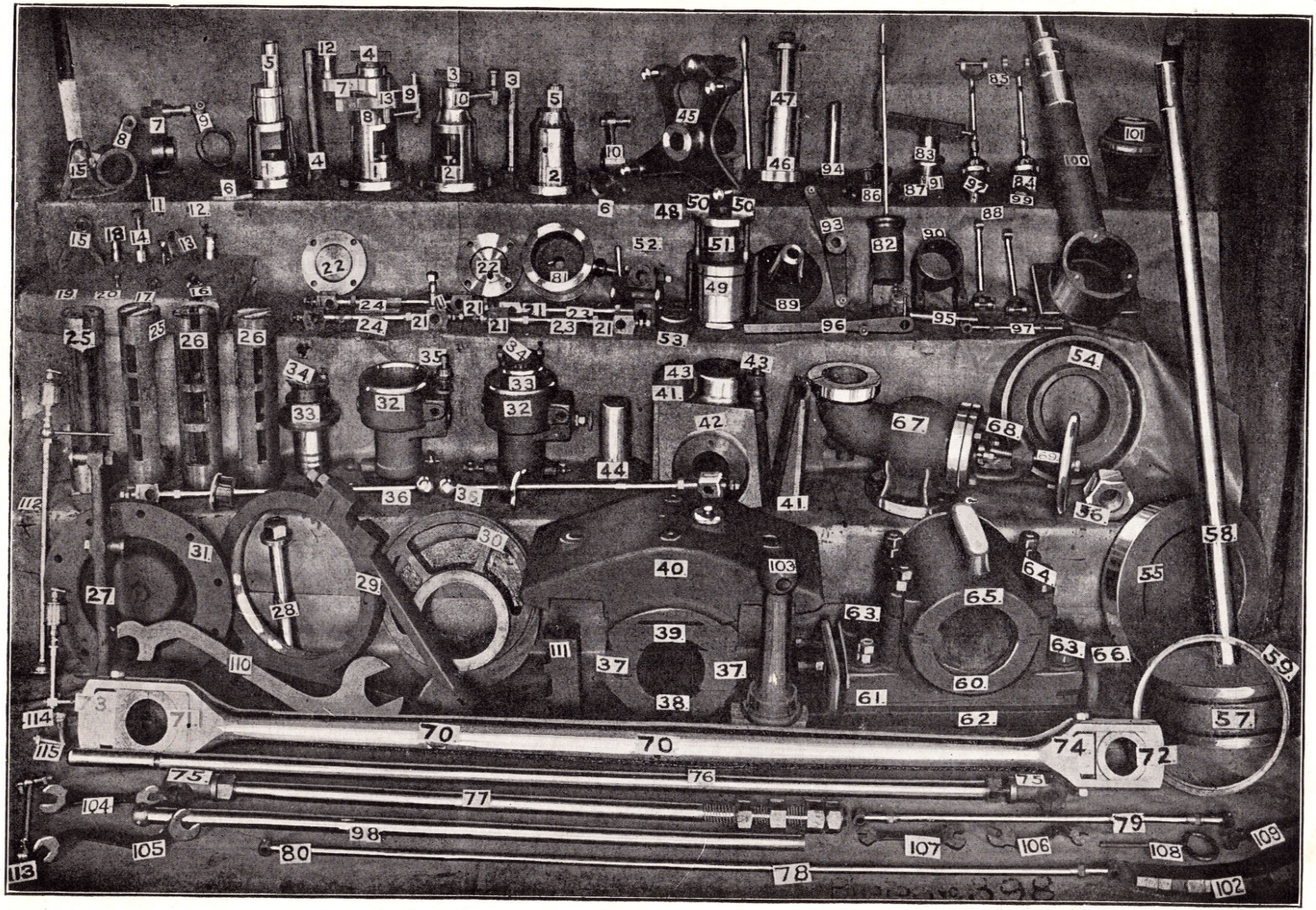
No. 1 Crank Shaft, Belted Type.
" 2 Governor Wheel with Governor Parts assembled.
" 3 Bracket for Valve Rod Slide Bar.
" 4 Cylinder Cover or Head.
" 5 Bolts for Crank End of Connecting Rod.
" 6 Cap for Crank End of Connecting Rod.
" 7 Connecting Rod Body.
" 8 Crank Pin Babbitt Liners.
" 9 Bronze Box in Connecting Rod Crosshead End.
" 10 Wedge for Adjusting Bronze Box in Connecting Rod.
" 11 Adjusting Bolt in Wedge of Connecting Rod.
" 12 Eccentric Straps.
" 13 Steam Chest Cover.
" 14 Piston Head.
" 15 Piston Rod.
" 16 Nut on Piston Rod to Crosshead.
" 17 Piston Rings.
" 18 Adjustable Shoe for Crosshead.
" 19 Crosshead Body.
" 20 Cross Head Pin and Nut.

PIECE NO.

No. 21 Adjusting Screw in Crosshead.
" 22 Eccentric Eye.
" 23 Exhaust Flange on Steam Chest.
" 24 Valve Rod Slide Bar.
" 25 Ball Arm for Governor.
" 26 Slide Valve, Ball Type.
" 27 Bushing in Cylinder for Piston Rod.
" 28 Gland in Piston Rod Bushing.
" 29 Throttle Valve Body.
" 30 Yoke or Bonnet on Throttle Valve.
" 31 Spindle for Throttle Valve.
" 32 Valve Rod from Slide Bar to Slide Valve.
" 33 Bushing and Gland Nut for Valve Rod.
" 34 Studs in Piston Rod Gland.
" 35 Eccentric Rod with Adjustable Brass at end.
" 36 Wrench for Connecting Rod.
" 37 Wrench for Nut on Piston Rod and Cross head.
" 38 Wrench for Connecting Rod.
" 39 Wrench for ½ and ⅝ Set Screw.
" 40 Eye Bolt, ⅝, for Main Bearing Caps.
" 41 Crossbar for Crank Pin Oiler, also Eccentric Oiler.

PIECE NO.

No. 42 Standard for Crank Pin Oiler also Eccentric Standard.
" 43 Oil Cup for Slide Bar Pin, ¼ Gas.
" 44 Oil Cup for Slide Bar Bracket, ¼ Gas.
" 45 Oil Cups for Main Bearings, ¼ Gas, also Crosshead.
" 46 Grease Cups for Governor, ¼ Gas.
" 47 Wrench for Adjusting Shoe on Crosshead.
" 48 Eye Bolt, ⅜, for Brass Box of Connecting Rod.
" 49 Wrench for ⅝ and ½ Cap Screws.
" 50 Wrench for Cylinder Cover Stud Nuts.
" 51 Nut for Ball Slide Valve.
" 52 Springs in Ball Slide Valve.
" 53 Brass Slide Box in Eccentric.
" 54 Pin through Eye Bolt and Ball Arm.
" 55 Spring Bolt in Governor Spring.
" 56 Eye Bolt in Governor Spring.
" 57 Governor Spring.
" 58 Pin in Ball Arm and Sliding Brass of Eccentric.
" 59 Ball Arm Pin through Ball Arm and Wheel Arm.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PLANT'S MACHINERY LIMITED

1780 ST. JAMES STREET,
MONTREAL, P.Q.

Leonard Corliss Engine—Single Eccentric Type—Name and Number of Each Part

PIECE NO.

No. 1 Steam Valve Bracket.
" 2 Exhaust Valve Bracket.
" 3 Exhaust Valve Spindle or Stem.
" 4 Steam Valve Spindle or Stem.
" 5 Brass Bushing for Steam and Exhaust Bracket.
" 6 Gland for Valve Stems of Steam and Exhaust Brackets.
" 7 Steam Valve Lever or Crank.
" 8 Steam Valve Bell Crank Lever.
" 9 Governor Knock-off Lever with two Steel Knock-off Cams.
" 10 Exhaust Valve Lever or Crank.
" 11 Pin for Steam Valve Bell Crank to connect with Wrist Plate.
" 12 Steel Sleeve and Cap for Latch Stud.
" 13 Spring and Spring Stud for Grab Hook.
" 14 Square Steel Latch Stud for Steam Lever.
" 15 Grab Hook or Pick-up Hook.
" 16 Steel Knock-off Face on Back of Grab Hook.
" 17 Steel Die for Pick-up Hook to engage with Latch Stud.
" 18 Pin Grab Hook to Bell Crank.
" 19 Cushion Leather for Pick-up Hook.
" 20 Bolt Steel Die to Pick-up Hook.
" 21 Brass End for Steam and Exhaust Links or Rods.
" 22 Bonnets for Steam and Exhaust Chests.
" 23 Exhaust Links or Rods connecting Wrist Plate and Exhaust Valve Crank.
" 24 Steam Links or Rods connecting Wrist Plate with Steam Valve Bell Crank.
" 25 Steam Valves.
" 26 Exhaust Valves.
" 27 Rock Arms and Pins.
" 28 Rock Arm Pin in Rock Arm on Frame.
" 29 Eccentric Strap.
" 30 Eccentric Eye.
" 31 Cylinder Cover or Head.
" 32 Vacuum Dashpot for closing Steam Valves.
" 33 Plungers for Vacuum Dashpots.
" 34 Nut for Adjusting Dashpot Rod in Plunger.
" 35 Air Valve on Cushion Chamber of Dashpot.

PIECE NO.

No. 36 Dashpot Rods Showing Ball.
" 37 Main Bearing Side Adjusting Quarter Box.
" 38 Main Bearing Bottom Quarter Box.
" 39 Main Bearing Top Quarter Box.
" 40 Main Bearing Cap.
" 41 Crosshead Adjustable Shoes.
" 42 Crosshead Body.
" 43 Adjusting Screws for Crosshead Shoes.
" 44 Crosshead Pin.
" 45 Wrist Plate.
" 46 Wrist Plate Bracket or Trunnion.
" 47 Pin in Wrist Plate Bracket.
" 48 Pin in Wrist Plate.
" 49 Piston Bush.
" 50 Piston Gland Stud.
" 51 Piston Rod Gland.
" 52 Locking Device Reach Rod to Wrist Plate.
" 53 Adjustable Weight for Governor.
" 54 Governor Pulley on Engine Shaft.
" 55 Cap for Cylinder Cover.
" 56 Nut Piston Rod to Crosshead.
" 57 Piston Head.
" 58 Piston Rod.
" 59 Piston Rings.
" 60 Outer Bearing.
" 61 Wedge Adjustable for Outer Bearing.
" 62 Sole Plate for Outer Bearing.
" 63 Studs and Nuts Outer Bearing to Sole Plate.
" 64 Studs and Nuts Outer Bearing Cap to Bearing.
" 65 Outer Bearing Cap.
" 66 Adjusting Screws for Side of Outer Bearing.
" 67 Throttle Valve Body.
" 68 Throttle Valve Bonnet.
" 69 Screw in Throttle Valve and Bonnet.
" 70 Connecting Rod.
" 71 Crank End Connecting Rod Box.
" 72 Crosshead End Connecting Rod Box.
" 73 Wedge for Crank End Box.
" 74 Wedge for Crosshead End Box.
" 75 End Box for Eccentirc or Reach Rod.
" 76 Reach Rod from Rock Arm to Wrist Plate.
" 77 Eccentric Rod, Eccentric to Rock Arm.

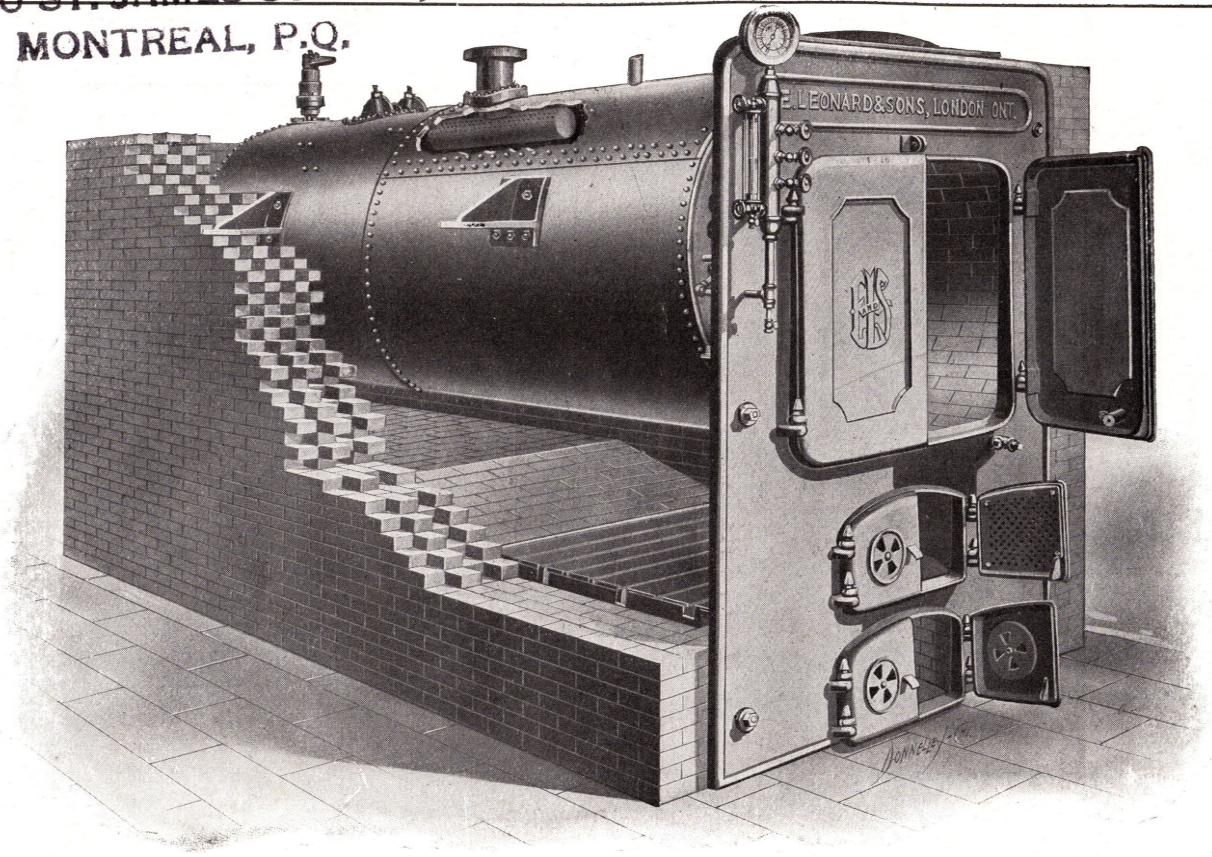
PIECE NO.

No. 78 Governor Rod from Governor to Head End Steam Valve.
" 79 Governor Rod from Governor to Crank End Steam Valve.
" 80 End for Governor Rod.
" 81 Pulley on Governor.
" 82 Dashpot on Governor.
" 83 Governor Yoke or Cross tree.
" 84 Balls on Governor Links.
" 85 Governor Links, Long.
" 86 Brass Governor Yoke.
" 87 Brass Gear on Governor Vertical Shaft.
" 88 Governor Links, Short.
" 89 Bearing for Short Governor Shaft.
" 90 Governor Bracket.
" 91 Steel Nuts on Yoke or Cross tree.
" 92 Collar or Keeper on bottom of Vertical Governor Shaft.
" 93 Lever Governor to Horizontal Rods.
" 94 Short Governor Shaft with Gear.
" 95 Pin in Bracket through Lever No. 93.
" 96 Slide Lever for Adjustable Weight.
" 97 Side Rod from Side Lever to Yoke on Cross-tree.
" 98 Vertical Governor Shaft or Spindle.
" 99 Collar above centre weight on Vertical Shaft.
" 100 Governor Post or Column.
" 101 Governor Centre Weight.
" 102 Sheet Iron Plate for removing Piston Rings.
" 103 Wrench for Piston Nut.
" 104 Wrench for Cap Screws on Valve Brackets.
" 105 Wrench for Main Bearing Quarter Box Adjusting Screws.
" 106 Wrench for Adjusting Piston Gland.
" 107 Wrench for Dashpot Screws.
" 108 Eye Bolt for Main Bearing Cap.
" 109 Wrench Adjusting Screws on Crosshead.
" 110 Wrench for Fly-Wheel Bolts and Main Bearing.
" 111 Adjusting Block for Main Bearing.
" 112 Crank Pin, Oil Stand and Cup.
" 113 Crank Pin, Oiler. Centrifugal Part Pin to Stand.
" 114 Crosshead, Oilcup and Bracket.
" 115 Crosshead Oiler in Crosshead Pin.

PLANT'S MA

RETURN TUBULAR BOILER WITH MANHOLE IN FRONT HEAD BELOW TUBES

CHINERY LIMITED
London, Canada
1780 ST. JAMES STREET,
MONTREAL, P.Q.



RETURN TUBULAR BOILER IN BRICKWORK, SHOWING DRY PIPE

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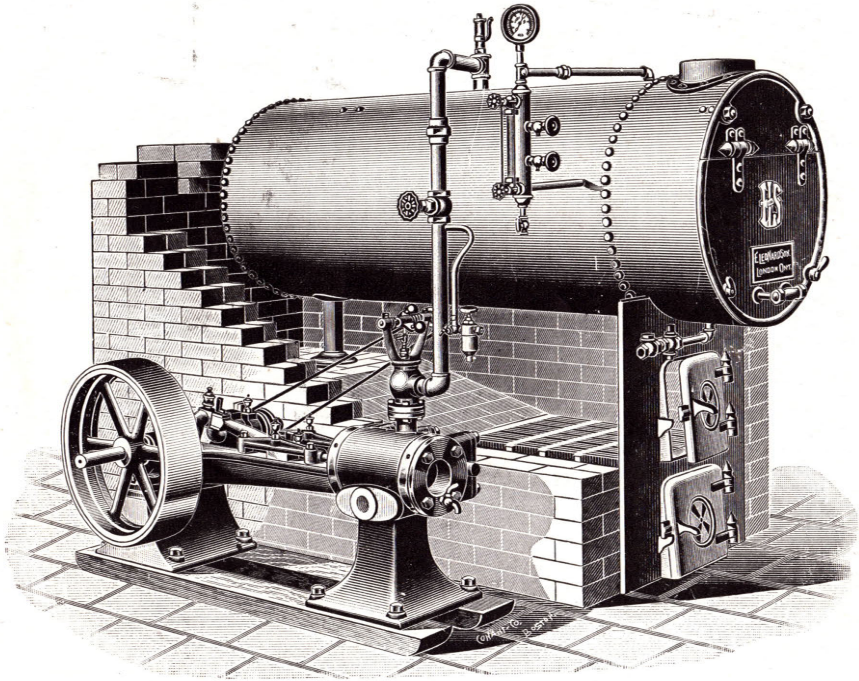
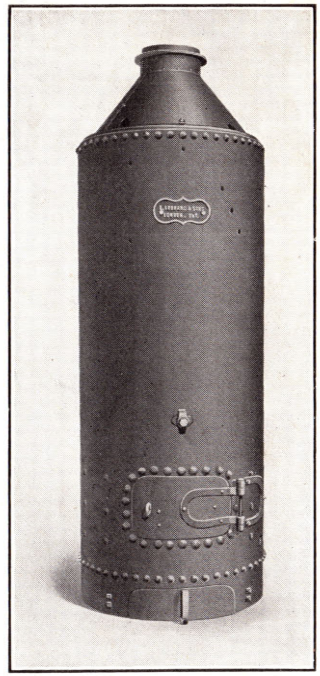


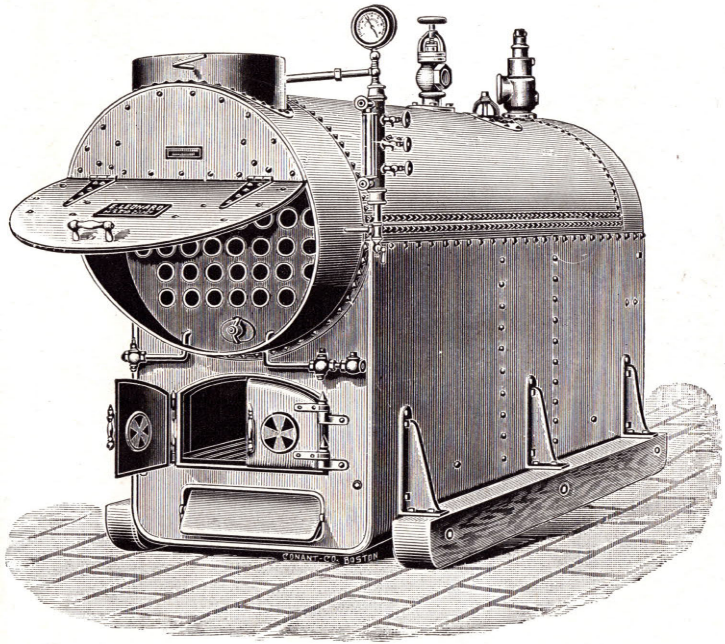
LEONARD ENGINE AND BOILER AS USUALLY ARRANGED FOR DAIRY OR SMALL FACTORY REQUIREMENTS.



UPRIGHT BOILER

CHINERY LIMITED
London, Canada
17[illegible] ST. JAMES STREET,
MONTREAL, P.Q.

Eclipse Semi-Portable Return Tube Boilers



WITH BRICK FIREFURNACES AND STEEL CASINGS, FOR PORTABLE MILLS AND MINING PURPOSES.

THE "ECLIPSE" Boiler is a type which combines many of the advantages of the brick-set Return Tubular Boiler with those of a more portable character.

Like the brick-set boiler, the flame passes along the bottom of shell and back through the tubes, giving a large area of heating surface.

THE CASING is of steel boiler plate, suitably stiffened with heavy fire-brick slabs lining sides and rear end.

Some of its advantages may be summarized as follows:

1st. In its complete state it is as portable as a locomotive boiler on skids.

2nd. Where roads are bad or mountainous, it may be taken apart in such a manner that the boiler shell proper is the heaviest single piece. Any intelligent man would be able to take apart or put together in proper order.

3rd. As the furnace may be made the full length of boiler, very long wood, edgings, etc., can be burned, a great advantage over the locomotive type with its restricted fire-box. It will successfully burn sawdust.

4th. It has no crown sheet to become bare with low water, nor screw stays to leak through unequal expansion and contraction when exposed to cold winds.

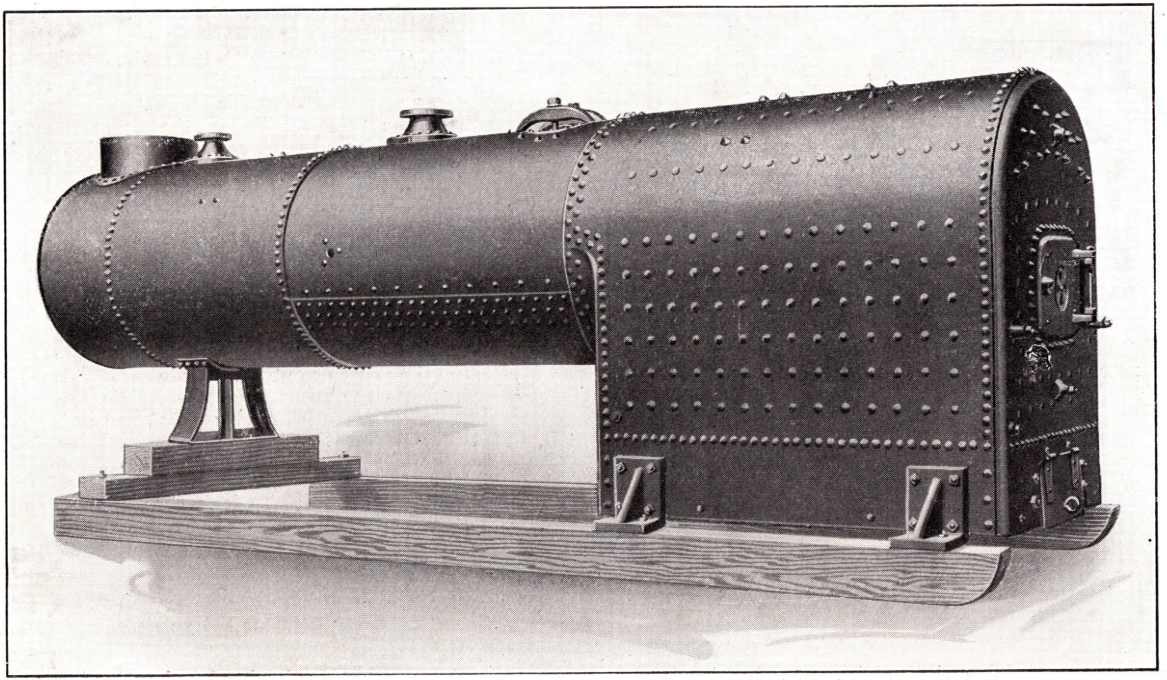
5th. For the same power, it occupies less room than a locomotive boiler.

These are some advantages, and "there are others." Write for Prices and Particulars.

USERS OF ECLIPSE BOILERS.

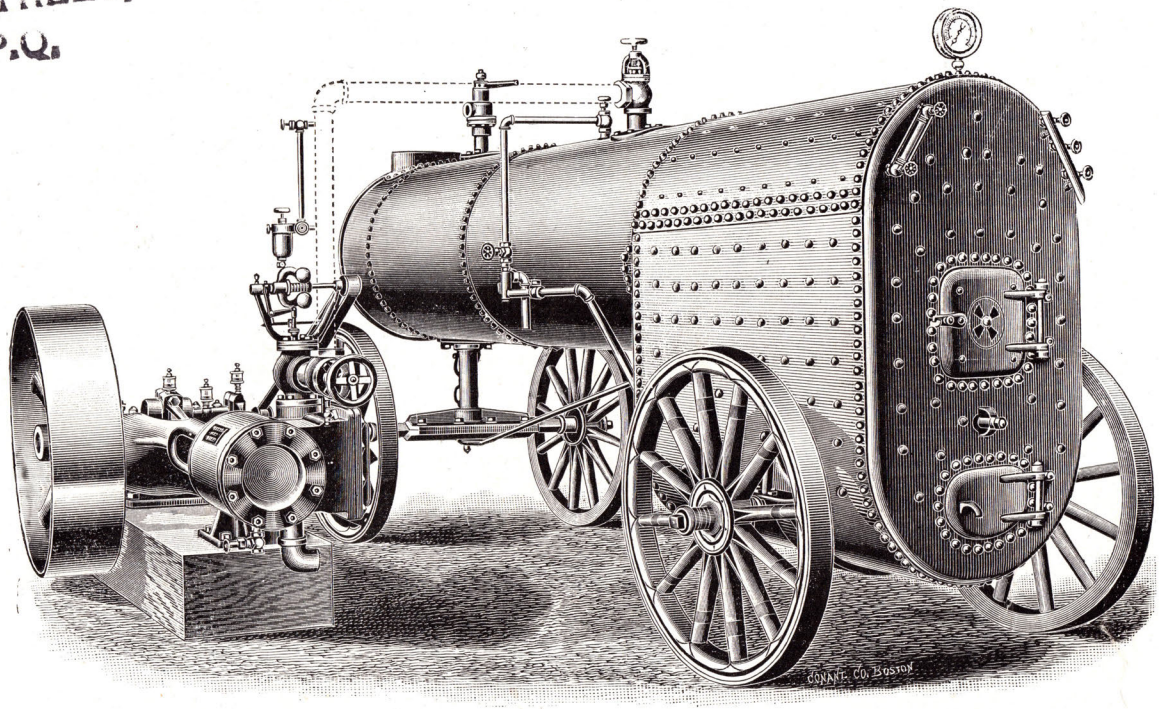
American Can Co., (Montreal Branch), New York, U. S. A.
Royal Collieries (2), Lethbridge, Alta.
J. A. Carignan, Grand Mere, Que.
R. J. Futa, Cranbrook, B. C.
Anaclet Gagnon, Lambton, Que.
E. G. Prior & Co., Vancouver, B. C.
Honsburger & Troup, Jordan Station, Ont.
A. D. McRae, Winnipeg, Man.
Bannell Sawyer, Montreal, Que.
W. R. Dobbie, Pincher Creek, Alta.
G. A. Werner, Mundare, Alta.
North West Lumber Co., Bonny Glen, Alta.
Department of Agriculture, Calgary, Alta.
MacPherson & Willbrand, Abbotsford, B.C.
Ferland & Parent, St. Charles de M., Que.
Alex. Dulman, Mistatem, Sask.

PLANTS MAC
1790



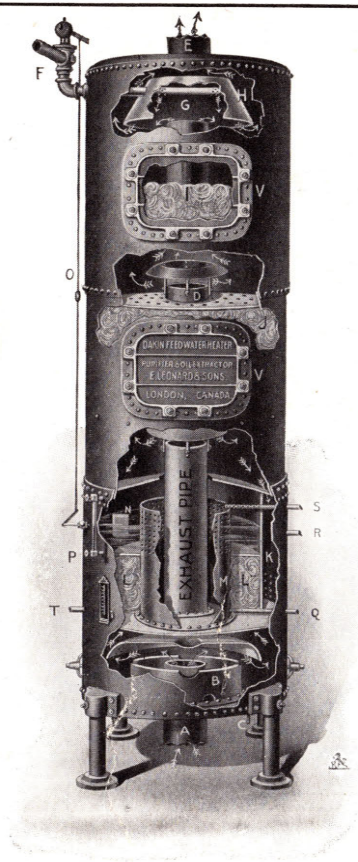
LOCOMOTIVE BOILER—OPEN BOTTOM—ON SKIDS

ST. JAMES STREET,
MONTREAL, P.Q.



LEONARD CLIPPER ENGINE AND LOCOMOTIVE BOILER ON WHEELS

PLANT 179



Dakin Feed-Water Heater, Purifier and Oil Extractor.

The cut on this page illustrates the DRAIN FEED-WATER HEATER, PURIFIER and OIL EXTRACTOR. It will keep the boiler free from scale, removing lime, magnesia and other impurities, and extract oil from the exhaust steam, and heat the water to from 210 to 212 degrees.

A DESCRIPTION OF THE FEED-WATER HEATER IS AS FOLLOWS:

A. Steam Inlet.
B. Oil Extractor.
C. Oil Drip Pipe.
D. Steam Pipes.
E. Steam Outlet.
F. Water Inlet Valve.
G. Spray Pipe.
H. Deflector.
I. First Filter.
J. Second Filter.
K. Settling Chamber.
L. Third Filter.
M. Pure Water Chamber.
N. Float.
O. Float Connection to Valve.
P. Gauge Glass.
Q. Pure Water Outlet to Pump.
R. Scum Pipe.
S. Overflow.
T. Scour Pipe.
U. Bypass.
V. Doors.

INSTRUCTIONS FOR SETTING UP, PACKING AND OPERATING FEED-WATER HEATER:

SETTING UP.

Set the Heater upright in any convenient place and at least eighteen inches above the level of the hot-water pump. By this means the water will be more readily pumped into the boiler, and any ordinary metal valve pump will pump the water. Connect exhaust steam pipe from the engine to bottom of heater at A. as shown in cut. Connect cold-water feed pipe at F. Connect hot-water suction pipe at Q. Connect overflow at S running down, allowing 2 ft. 3 in. for every pound of back pressure carried for heating purposes with exhaust steam, and return to within two inches of S. and then lead away to sewer. Connect scum pipe K and scour pipe T into the branch of overflow pipe that leads to sewer. Grease drip C can also be connected to overflow pipe, but this drip must be left, or partly, open continually. This is imperative.

PACKING UPPER CHAMBER I AND J.

Remove top grates of each section. Cut three or four ply of burlaps or coarse sacking to fit bottom grates, then fill the chambers with excelsior or straw, preferably excelsior, to within three inches of top of door. Excelsior to be firmly packed. Put the top grates on this and weight down with some heavy body so as to prevent exhaust of engine from disturbing excelsior.

BOTTOM CHAMBER L.

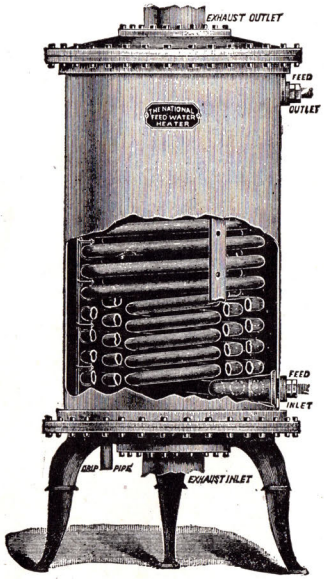
Remove top grates. Put in six or seven inches charcoal or coke, then six inches Excelsior, on top of which put two ply of burlap. Pack firmly, and then they lay on top grates, weighing them down same as upper chamber.

OPERATING.

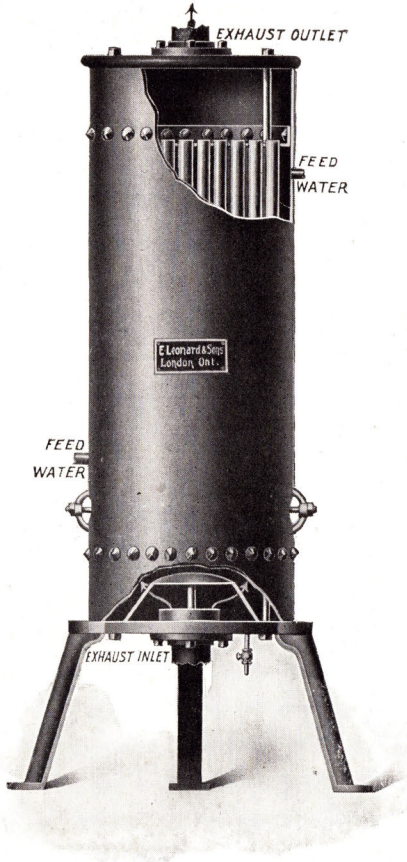
When the steam plant is in operation, the hot-water pump to feed boilers should be kept going continually at such a rate of speed as will keep water in boilers at the proper level. Water drawn from the heater by following this course will be hotter and purer than would be the case if the pump is being continually stopped and started. Overflow pipe S to be left open. Scum cocks R to be opened three or four times daily, as may be required. Blow-off pipe T should be opened daily to ensure cleanliness at bottom of chamber. Drip pipe C to be left open so as to allow condensed water and oil to escape from oil extractor. Heater should be cleaned out every four or five weeks, or oftener; in some cases the impurities of the water require the heater to be cleaned every two week. In cleaning, remove upper plates, excelsior, burlaps and coke, and repack same as before,

List of Users on Page 30.

S MACHINERY LIMITED
O ST. JAMES STREET,
MONTREAL, P.Q.



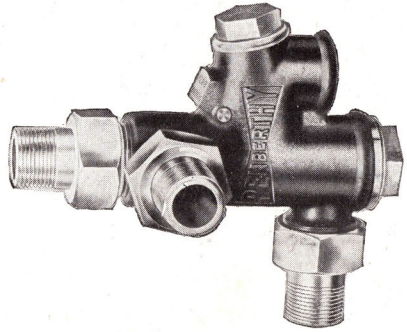
NATIONAL
FEED WATER HEATER
Inside Manifold Type



UPRIGHT PRESSURE HEATER

Penberthy Automatic Injector

Be sure the "Trade Mark" is on the body of the Injector.

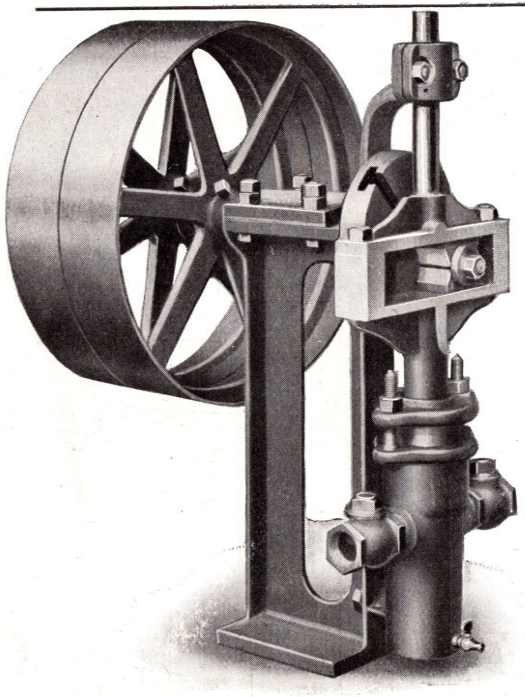


Stock Injector
Style Left and Back. Suction Left, Overflow Front, Discharge Back
PRICE LIST.

Size.	List Price.	Horse Power Based on Ordinary Tub. Boiler	Pipe Connection	Capacity Per Hour, 1 to 3 feet lift, 60 to 110 lbs. Steam Pressure	
				Maximum	Minimum
O	$15 00	3 to 6	¼-inch	60 Gals.	35 Gals.
OO	16 00	4 " 8	⅜ "	80 "	45 "
A	18 00	8 " 16	½ "	135 "	70 "
AA	20 00	12 " 22	½ "	180 "	100 "
B	25 00	17 " 32	¾ "	260 "	140 "
BB	30 00	20 " 45	¾ "	360 "	180 "
C	40 00	40 " 65	1 "	475 "	250 "
CC	45 00	45 " 80	1 "	600 "	325 "
D	55 00	50 " 100	1¼ "	800 "	425 "
DD	60 00	75 " 135	1¼ "	1000 "	525 "
E	75 00	100 " 180	1½ "	1400 "	740 "
EE	90 00	115 " 255	1½ "	1900 "	850 "
F	110 00	160 " 320	2 "	2400 "	1275 "
FF	125 00	200 " 400	2 "	3000 "	1600 "
G	150 00	300 " 500	2½ "	3600 "	1875 "
GG	200 00	375 " 600	2½ "	4200 "	2150 "

N. B.—Where Injectors are ordered by size connections, we always send the size having the larger capacity. Order by letter as in "size" column of table.

Discount from above prices.



Adjustable Force Pumps

FOR BOILER FEEDING, ETC.

For 1-inch, 1½-inch or 2-inch Pipe

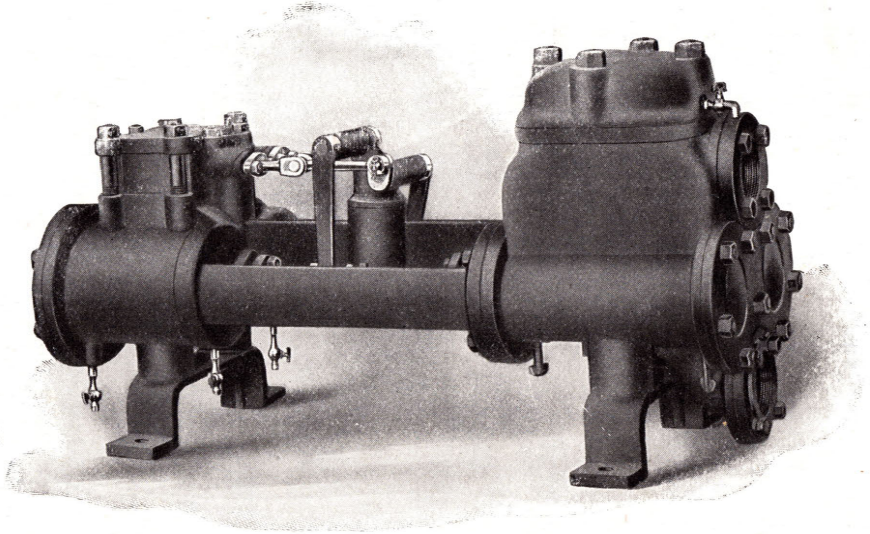
Also made with double plungers.

Duplex Boiler Feed Pumps

This cut shows one designed for boiler feeding and general service where water pressure does not exceed 150 pounds.

They have two double-acting plungers or packed pistons with rubber valves, brass seats, guards and springs, and are suitable for pumping hot or cold water The illustration is of a 4½ x 2¾ x 4, and shows the four (4) cylinders and stretchers cast in one piece. The larger sizes have water cylinders cast separately.

Extra charge for brass plungers and rods.



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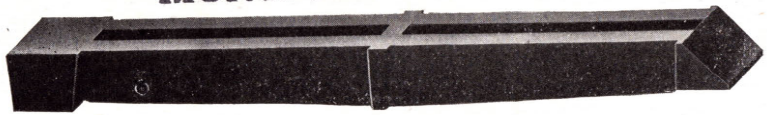
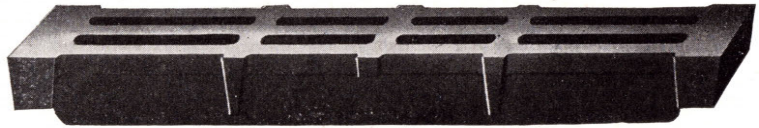
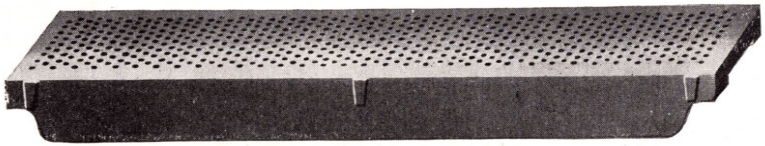
London, Canada
MONTREAL, P.Q.



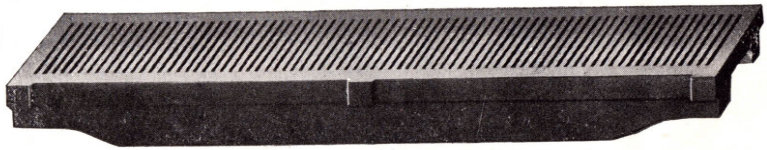
GRATE BAR FOR COAL.



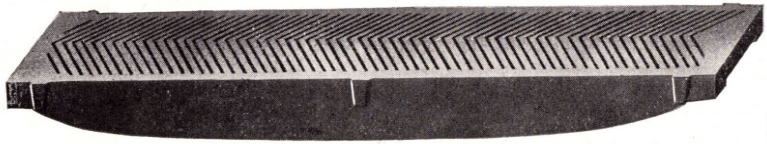
GRATE BAR FOR WOOD.



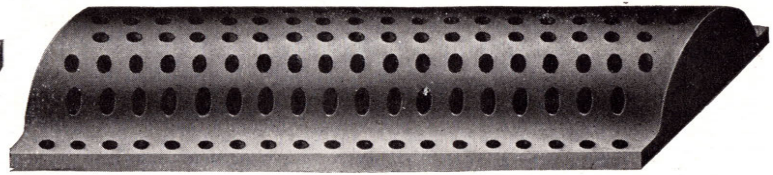
GRATE BAR FOR FINE COAL SCREENINGS,
BUCKWHEAT HULLS, SAWDUST, ETC.



ST. JOHN GRATE PATTERN.

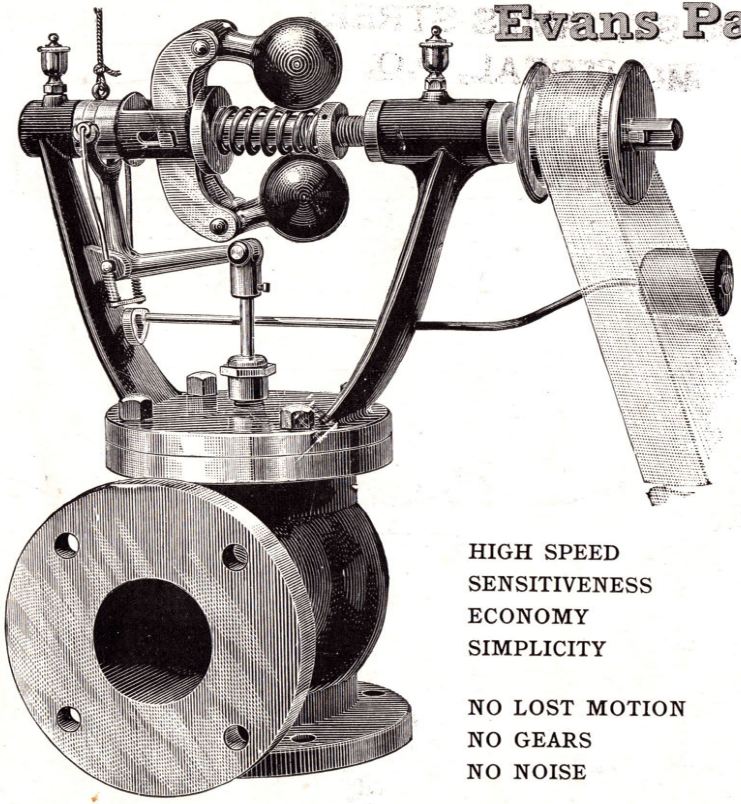


HERRINGBONE OR TUPPER GRATE.



CONE GATE FOR SAWDUST, ETC.

Evans Patent Engine Governor



HIGH SPEED
SENSITIVENESS
ECONOMY
SIMPLICITY

NO LOST MOTION
NO GEARS
NO NOISE

NOTICE—Governors 3 ins. and over are flanged as per illustration; 2½ ins. and under are flanged on steam outlet (next the engine) per illustration, but are generally threaded on the steam inlet side. In ordering repairs, the letters designating part required should be referred to.

GREATEST RANGE OF SPEED ADJUSTMENT

DIRECTIONS.

To get the best results, SPEED of Governor should be about as follows:

1 in. to 1½ ins.,	- -	600 revolutions per minute
2 in. to 3½ ins.,	- -	550 revolutions per minute
4 in. to 8 ins.,	- -	500 revolutions per minute

To Regulate Speed of Engine, screw nut J tighter to increase speed, or slacken back to decrease speed. For a great change of speed—say 50 revolutions—the valve should be raised to increase speed or lowered to reduce the speed by means of set screw in the yoke M, and then regulated to exact speed by the nut J.

In All Sizes from 1½ ins. to 8 ins., we provide a combined instantaneous stop motion and automatic safety stop, operated as follows: If the governor belt breaks or comes off, the pulley Y drops, revolving the cam E, and pushing saddle H up out of gear, which allows the valve to drop, thus shutting off steam; or the same result is attained by pulling on the cord Q, which cord can be conveniently carried to any part of the mill or factory.

Can be provided with variable speed attachment if required.

Carried in stock for immediate shipment.

WRITE FOR PRICES.

MACHINERY LIMITED

120 ST. JAMES STREET, MONTREAL, P.Q.

The "Swift" Sight-Feed Lubricator

DOUBLE CONNECTION
Class F.

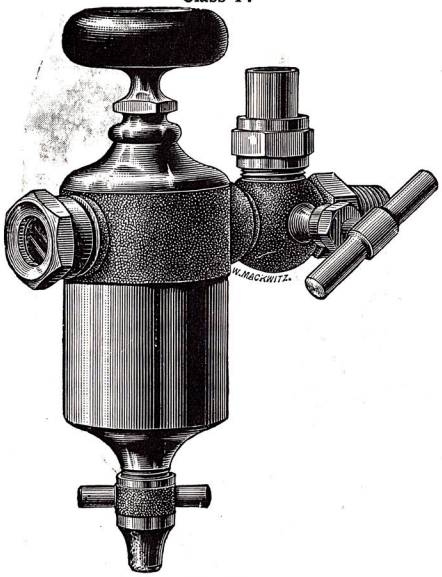


Fig. 25

This Lubricator is especially designed for Stationary Engines, Steam Pumps, etc., and is a universal favorite with the builders of this class of work.

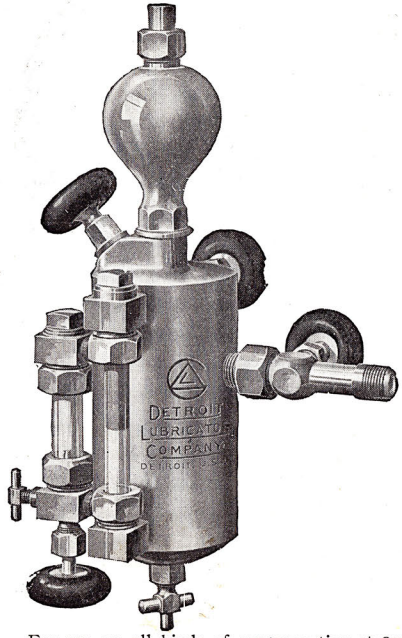
PRICE LIST.

Capacity	¼ Pt.	½ Pt.	½ Pt.
Brass Finish	$2 75	$3 00	$3 25
Nickel-Plated	3 15	3 40	3 65
Pipe Thread	⅜″	⅜″	⅜″
Capacity	1 Pt.	1½ Pt.	1 Qt.
Brass Finish	$4 65	$5 40	$6 15
Nickel-Plated	5 30	6 05	6 80
Pipe Thread	½″	½″	½″

The above prices cannot be adhered to under present conditions.

Detroit Improved Standard Lubricator

Double Connection



For use on all kinds of reciprocating steam engines, steam pumps, etc.

Installed with both connections between the boiler and the throttle.

Finished in polished brass or nickel-plated.

Size	⅛ Pt.	½ Pt.	1 Pt.	1 Qt.	½ Gal.	1 Gal.
Pipe Thread on Support Arm	½	½	½	½	¾	¾

Instructions for installation and operation on pages 216, 217.

Duplicate parts lists on pages 138 to 147.

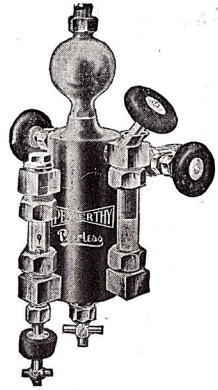
DOUBLE CONNECTION

Sight-Feed Penberthy Peerless Lubricator

Strictly High-Grade

Exclusive in Design. Scientific in Construction. Reliable in Action.

Specially Designed for Stationary and the Better Class of Engines.



Cut No. 420

Some of Its Excellent Features.

The filler chamber contains a patent vent which allows the air to escape quickly as the cup is being filled. Prevents the overflow and waste of oil.

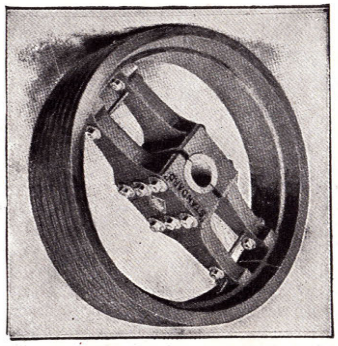
The drain valve for the sight-feed glass is directly under the oil-regulating valve, a combination of two valves in one, but operated entirely independent of each other. The position of this drain valve mentioned above protects the oil regulating valve from being covered with oil and water when draining the sight-feed glass.

The Peerless will feed heavy oils and work well in cold weather, from the fact that the arm passing through the oil body is constantly filled with live steam which keeps the oil always in a liquid condition

PRICE LIST

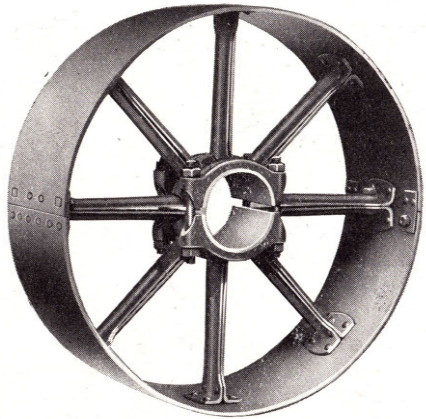
Capacity	⅓ Pint	½ Pint	1 Pint	1 Quart
Brass Finish	$17 00	$20 00	$26 75	$35 00
Nickel-Plated	20 00	23 00	31 75	40 00
Pipe Thread	½ in.	½ in.	½ in.	½ in.
Code Word—				
Brass Finish	Drover	Decide	Dandy	Decade
Nickel Finish	Prosper	Pretty	Plover	Potter

Subject to a Discount.

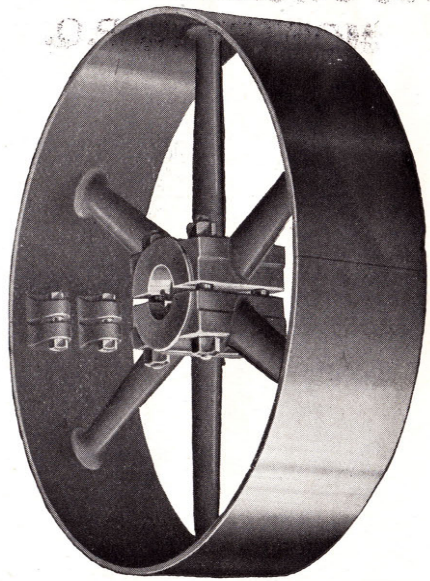


DODGE STANDARD WOOD SPLIT PULLEYS

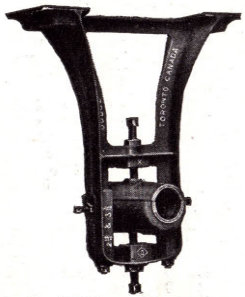
With Interchangeable bushings.
Standard List Adopted January 1st, 1909.



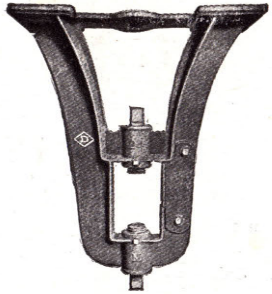
DODGE STEEL SPLIT PULLEYS.



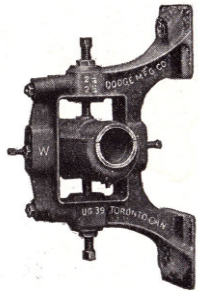
LARGE IRON SPLIT PULLEY



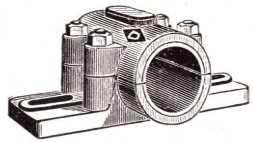
DROP HANGER FRAME



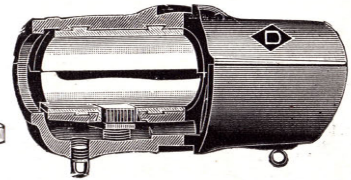
DROP HANGER



POST HANGER

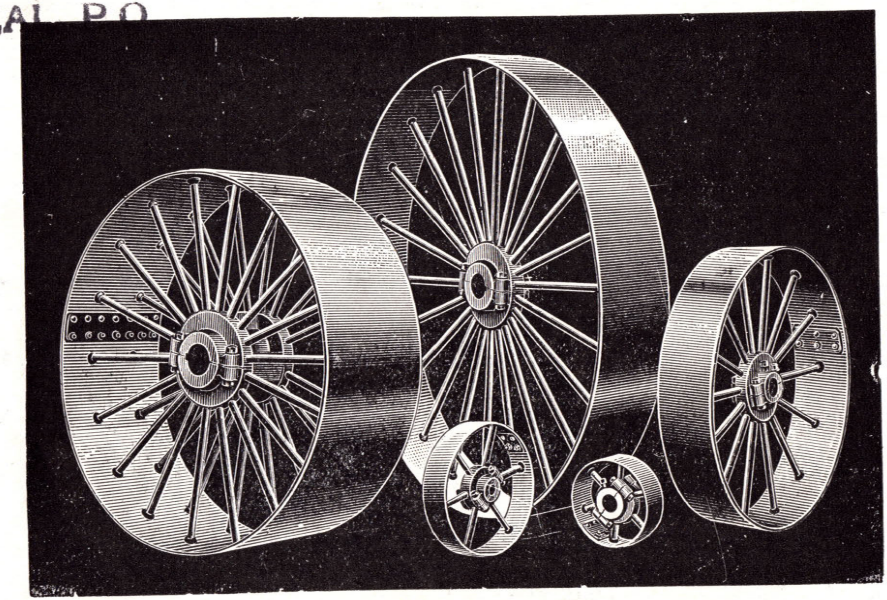


STANDARD RIGID



CAPILLARY-OILING

MACHINERY LIMITED
London, Canada
MONTREAL P.Q.

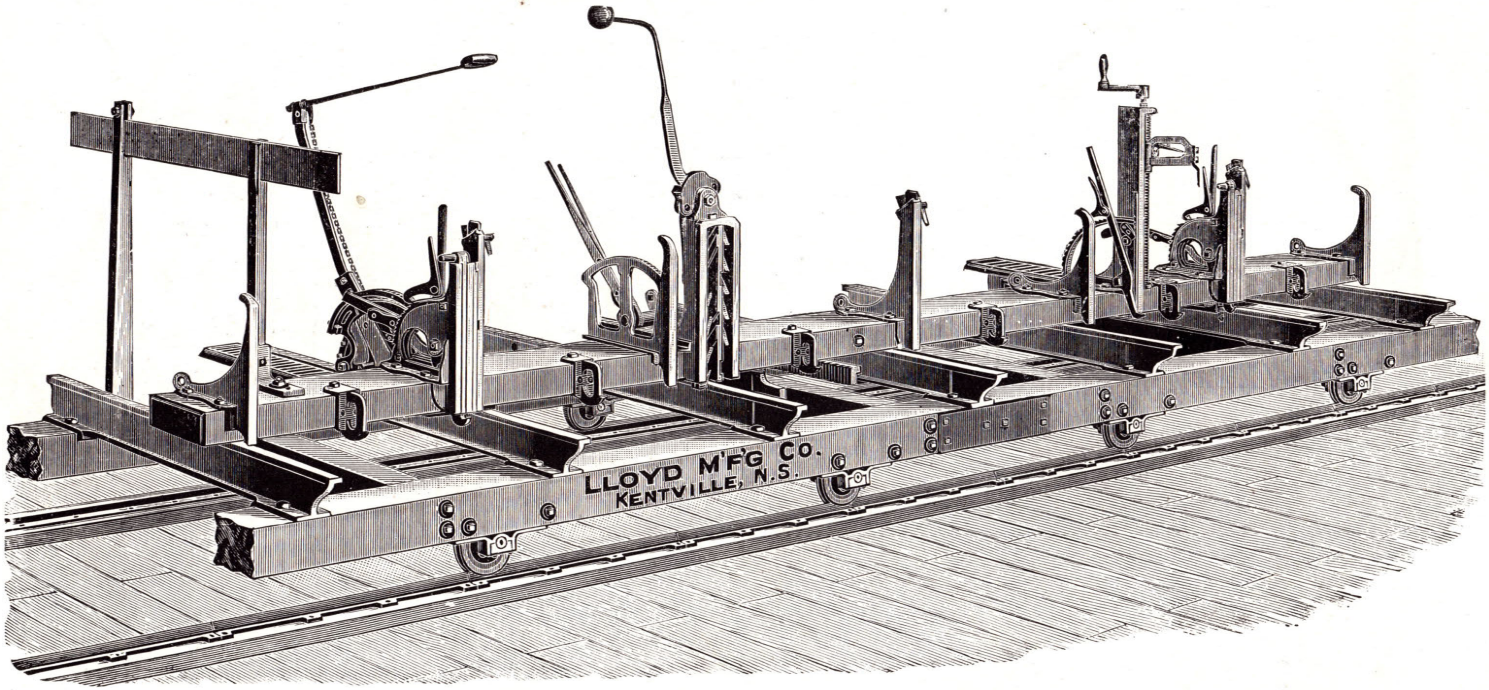


Canadian distributors at St. John, N. B., for Douglas, Lawson & Co., of Birstall, Leeds, England, Extensive Manufacturers of the Celebrated

"Stanchion" Patent Wrought Iron Pulleys

Known the world over. Very best materials and workmanship. Quick delivery. Moderate Prices.

Rotary Saw Mill Carriage

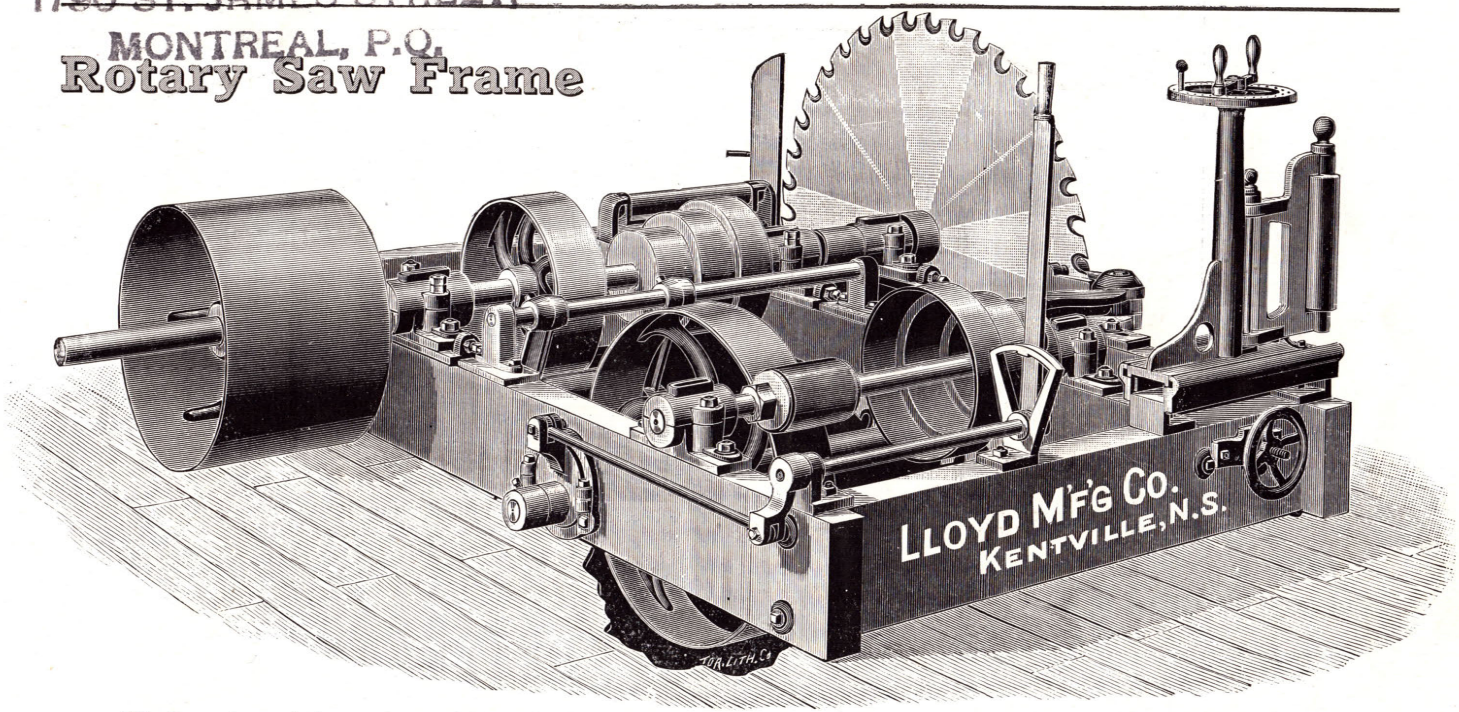


This is a Standard Portable Mill, built to be operated with from 35 to 60 h.p. and is capable of cutting anywhere from 12,000 to 25,000 feet of lumber per day.

E. LEONARD & SONS, SELLING AGENTS.

MACHINERY LIMITED
London, Canada
1750 ST. JAMES STREET
MONTREAL, P.Q.

Rotary Saw Frame



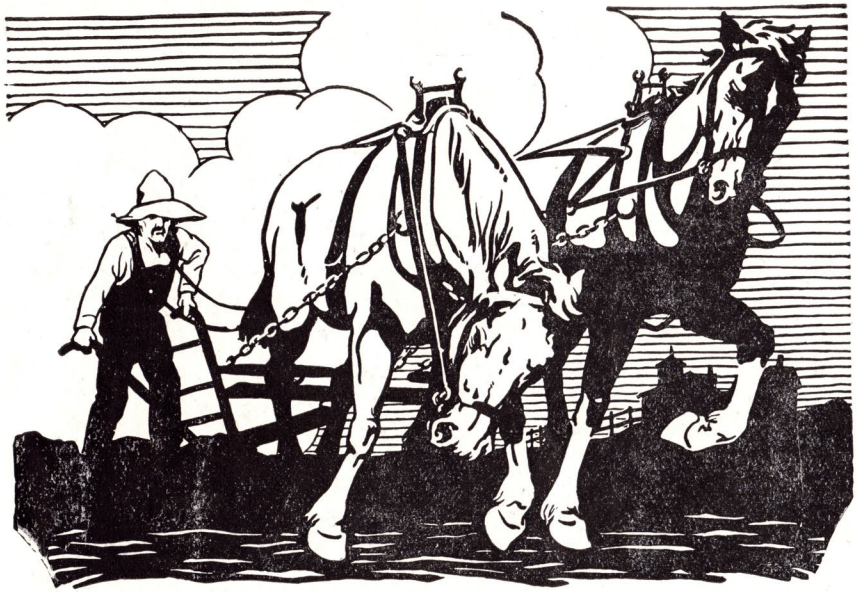
The frame is made from selected timber; it is well proportioned, and joint bolted at every joint, making it very rigid and durable.

The irons are nicely fitted to it, the principal ones resting upon iron plates which are imbedded in the timber and securely bolted to the timber.

The saw arbor is made of the best quality of steel and temper, which combines strength and stiffness.

It is accurately turned and keyseated, and the collars are fitted with the utmost exactness. The fast or shrink collar is made very broad on its face; by making it in this way we secure great strength in the collar, the collars are six inches in diameter and fitted for standard saws, having a 2-inch mandrel hole and two $\frac{5}{8}$ lug pin holes, four inches from centre to centre; the arbor runs in three boxes which are secured to saw frame, all are very long and the full size of the arbor and are lined with a superior quality of babbit metal; the end play of the arbor is taken up or regulated by a set-collar on one side and the hub of a pulley on the other, which relieves the saw collar of any friction whatever and avoids any heating of saw collar by friction, and the most common cause of hot collars and bad running saws is removed.

E. LEONARD & SONS, SELLING AGENTS.



HUBER
Light Four

The Huber Light Four does the work of 4 men and 12 horses. Does it better. Easily pulls three 14-inch bottoms set 8-inches deep in any land where a *good* team can pull one bottom. Enables you to plow deeper, make a better seed bed, and get more crops. Does it cheaper. Burns gasoline, kerosene, or distillate. Economical in fuel consumption.

The Huber Light Four does most of the work horses can do and many things that horses cannot do at all. Furnishes power for plowing, pulling the harrow, the seeder, the manure spreader; runs the ensilage cutter, buzzes wood, hauls loads, pulls stumps, helps in road construction, Unlike most farm machinery, it works every month in the year.

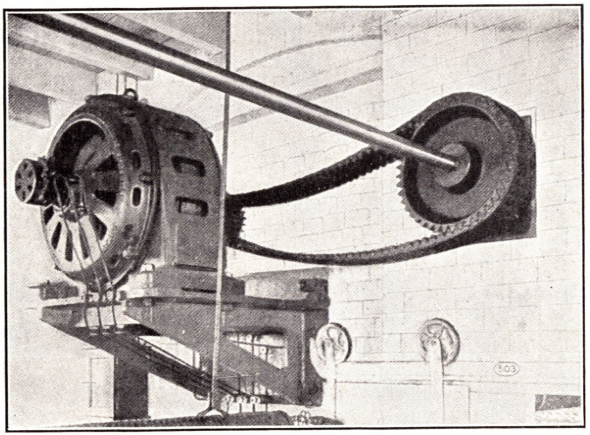
The Huber Light four is the most efficient unit of farm power. Built by manufacturers having forty years' experience in the making of tractor engines and threshing outfits. Delivers 12 h. p. at the draw-bar, 25 h. p. at the belt. 4 Cylinder Waukesha Motor, water cooled, never runs hot. Automatic splash lubrication. Cut steel gear transmission. heat treated, running in oil bath, Hyatt Roller and Gurney Ball Bearings. In the 5,000 pound class—does not pack the ground. Turns in a six foot radius. Road speed, 2½ miles an hour in low, 4 miles an hour in high.

Let no man or beast do work a machine can do

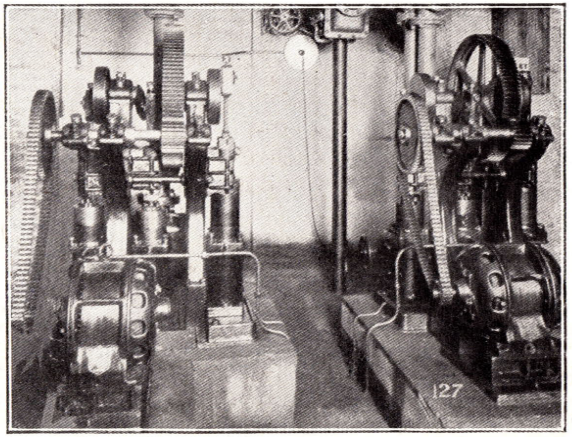
Farm labor costs more than ever before. Feed is high and going up. Horses were never so valuable. Don't use skilled men and expensive teams to do work that can be done more quickly, more efficiently, and more economically by a machine. Don't keep more horses than you need most of the year just to have enough power during the rush season.

MACHINERY LIMITED
1790 ST. JAMES STREET
MONTREAL, P.Q.

Renold Chain Transmission



Typical 40 H. P. Silent Chain Drive from Motor to Lineshaft.



Renold Silent Chains operating Pumps in Power Station.

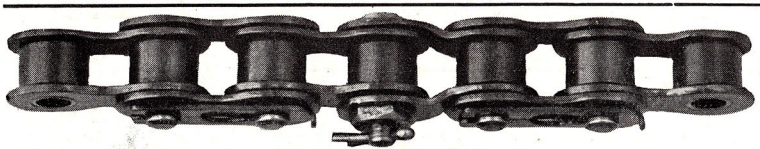
Leather Belts, Ropes, Spur, Bevel, and other Tooth Wheel Transmission, will always be used in some places and under certain conditions, but as Driving Chains have become better known and their many advantages appreciated, they have in a great many instances taken the place of these older methods of Power Transmission.

The three chief types of high grade Steel Chains for transmitting power are: the Patent Silent, the Bush Roller and the Solid Steel Block Chains. All bearing surfaces of each of these types of Chain are case-hardened.

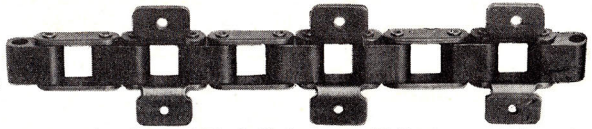
THE PATENT SILENT CHAIN is particularly suited for High Speed Service, Drives of ¼ H.-P. to 5,000 H.-P. being in successful operation at speeds ranging from 1,000 to 1,800 feet per minute. Higher chain speeds are usually unnecessary as the chain sprockets generally are only ⅓ to ½ the diameter of correponding belt pulleys.

THE BUSH ROLLER CHAIN which is extensively used on Automobile Trucks is particularly suited for heavy duty service at moderate speeds, say from 400 to 1,000 feet per minute, at which speeds it is for all practical purposes noiseless.

THE SOLID STEEL BLOCK CHAIN is used for comparatively slow Drives such as Elevators and Conveyors. It has to a great extent replaced the Malleable Sprocket Chains on account of its great strength, durability,



Renold Bush Roller Chain.



Renold Solid Steel Block Chain fitted with Bentover attachment Links for Elevator Buckets.

and adaptability for fixing special attachments. It can be successfully operated at speeds up to 500 feet per minute and is capable of transmitting from ¼ H.-P. to 100 H.-P.

RENOLD CHAIN DRIVES—Show the highest SUSTAINED efficiency of all forms of Power Transmission.

Will run in either direction.
Can transmit any amount of power.
Can be used on short or long centres.
Are not affected by heat, cold or moisture.
Provide a positive and pre-determined speed ratio.
Reduce journal friction to a minimum.

RENOLD CHAIN DRIVES—Are Superior to Leather Belting because:—

No slippage.
Can be run on short centres.
Can be used in hot, cold, or damp places.
Can be run slack thereby eliminating excessive journal friction.
The sustained efficiency is higher than is obtainable with a Belt operating under the best conditions.

RENOLD CHAIN DRIVES—Are superior to other Tooth Wheel Gearing because:—

They operate quietly.
Can be run at high speeds.
Centre distances can be arranged to suit convenience of design.
More teeth are in working contact thus ensuring smoother action with less wear which is extremely important with large speed ratios.

The field of application for Chain Drives is unlimited as the positive speed ratio ensures the maximum production under any conditions.

Chain Drives of varying powers may be found in the leading Canadian Industrial Plants, Municipal Power Stations, Grain Elevators, Ship Yards, Pulp and Paper Mills, Lumber Mills, Textile Mills, Rubber Manufacturing Plants, Steel Mills, etc., etc., and illustrations of practically any application will be gladly furnished on request.

Full stocks of Chain, Spare Parts, etc., are always on hand, and having a large range of Wheel Patterns with suitable Form Cutters for the teeth, prompt deliveries of complete Drives are made.

In asking for quotations kindly furnish information as to Maximum H.-P. to be transmitted, class of service Chain is to be used for i.e., type of Machinery to be operated, speeds and sizes of Driver and Driven Shafts, maximum sizes of Wheels permissible, whether split or solid Wheels, and centre to centre distance of Shafts, etc.

Bulletins giving full details and illustrations of various applications gladly furnished on request.

E. LEONARD & SONS, Limited, ST. JOHN, N. B.

TO OUR MARITIME PROVINCE CUSTOMERS.

We would say that at our Machinery Depot 58 to 62 Water Street, St. John, N.B., you will find a full line of general machinery, both new and used refitted machinery, embracing the following:

Engines and Boilers, of our own and other makes.
Full line of Hoisting Engines, made by Messrs. M. Beatty & Sons, Welland, for whom we are the Maritime Agents.
Full line of Wood Working Machinery, made by Cowan & Company.
All kinds of Saw Mill Machinery made by the Lloyd Manufacturing Co.
Gasoline and Kerosene Engines, Marine and Stationary.
Power, Centrifugal, and Pulsometer Steam Pumps.
Feed Water Heaters, and Purifiers.
Air Compressors.
Steam and Air Drills.
Dynamos and Motors, Fans, Blowers and Conveyors.
Lath, Shingle, Stave and Box Machinery.
Steam Feeds for Saw Mills.
Orange Peel, Clam Shell, and Dumping Bottom Buckets.
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Derricks and Derrick Irons.
Engine and Boiler Fittings.
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Everything in fact in the Machinery Line.

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